ENVIRONMENTAL FACTORS AND ANXIETY LEVELS OF PREGNANT WOMEN

A thesis
submitted in partial fulfilment
of the requirements for the Degree
of
Master of Arts in Education
in the
University of Canterbury
by

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University of Canterbury
1979

"For men and women are not only themselves; they are also the region in which they were born, the city apartment or farm in which they learned to walk, the games they played as children, the old wives tales they overheard, the food they ate, the schools they attended, the sports they followed, the poems they read, and the God they believed in."

W. Somerset Maugham
"The Razor's Edge".

ABSTRACT

The present study was concerned with the effects of Antenatal Class Attendance and other environmental influences on the anxiety levels of pregnant women. Subjects were 258 women (91 primi-, 107 dui-, and 60 multigravidae) at various stages of pregnancy of whom 92 were currently attending antenatal classes, 87 were not currently attending antenatal classes but had previously attended such classes, and 79 were not attending antenatal classes and had never previously done so. Subjects completed the Pregnancy Research Questionnaire from which estimates of anxiety and other psychological reactions were derived. A background information questionnaire was also completed by each subject and was used to obtain details on the subject's environment.

Two sets of analyses were undertaken. Firstly, multiple regression analyses were used to examine the extent to which anxiety measures could be predicted from the set of environmental details. The results indicated that anxiety and other measures were very difficult to predict and that attendance at antenatal classes did not make a substantial contribution to such prediction. The most potent influence on anxiety levels (in terms of proportion of variance accounted for) appeared to be degree of financial security (with high anxiety associated with low financial security). A multivariate analysis of variance (MANOVA) was also used to ascertain the

characteristics which distinguished highly anxious women from others in the sample. A variety of factors differentiated these groups and among such factors, the importance of degree of financial security was apparent. A series of exploratory analyses (MANOVA's) were also undertaken and the implication of financial insecurity as an influence on maternal anxiety was again indicated. The results were discussed in terms of the difficulties involved in assessing environmental influences, the implications for future antenatal course planning, and the need for additional support services for financially insecure women.

ACKNOWLEDGEMENTS

The author wishes to express her very sincere thanks to her supervisors, Dr. K. M. Wilton and Mr B. Keeling, who so willingly shared their knowledge throughout this investigation. Their constant guidance and encouragement has been of the utmost value.

Sincere thanks is also expressed to Drs. Noeline Walker and Helen McGill for their advice on medical aspects of the investigation, and to the members of the Canterbury faculty of the New Zealand College of General Practitioners for their cooperation. Appreciation is also expressed of the assistance given by the staff of the medical centres and by the women who participated as subjects in the study.

Special thanks is due to Mrs Gwen Gilmore who enthusiastically assisted in the distribution of the questionnaires, and to E. Schaefer and H. Manheimer who permitted the use of their Pregnancy Research Questionnaire.

Finally, my sincere gratitude is expressed to my family and friends for their encouragement and for the ideas and suggestions they have offered in our frequent discussions.

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CHAPTER ONE

INTRODUCTION

Special educational facilities for mentally retarded children currently available in New Zealand schools include a variety of special class and special school provisions. When one considers the records of children placed in these facilities, it becomes apparent that a variety of factors can cause mental retardation. Some (eg., genetic factors,) are obvious causes of mental retardation and can be seen in children with Down's Syndrome, those with phenylketonuria, etc. Other factors are biological in nature such as deafness, prenatal rubella infection, meningitis, and encephalitis. The majority of cases of mental retardation (perhaps as many as 75 percent) are known to be due to cultural-familial influences with no known organic cause (Robinson & Robinson, 1976). Other contributing factors seem much more subtle and the adverse events may in fact have occurred during the prenatal period or during the birth process. It is now suspected that instances of mental retardation may have been caused by damage to the brain during the prenatal-perinatal period - damage too slight to be determined by current methods of detection.

The prenatal environment is affected by such influences as the mother's age, her state of physical

health, whether or not she is on medication, the quality of her dietary habits and many other factors which directly affect the maternal environment. The presence of pollutants in the atmosphere, water sources and food has become a very topical issue, especially with regard to lead, mercury and chemical sprays, and it seems likely that such pollutants would have a discernible influence on foetal development.

It has become apparent that a woman's emotional state during pregnancy can, and often does, affect the outcome for the foetus in at least two ways. Firstly, emotional stress experienced by the mother can produce chemical changes in the intrauterine environment. During the stressful episode, chemical substances are manufactured by the nerve endings, and adrenal corticosteroids are released, which can pass into the circulatory system of the foetus via the placenta. It is possible, and seems likely that these additional chemicals may sometimes be harmful to the foetus. It has been shown that severe emotional stress produced in animals can cause embryonic resorption and stillbirth, and there is a strong possibility that this could be true for humans as well. Emotional stress may also affect the woman's ability to absorb nourishment - a condition which could adversely affect the growth pattern of the foetus.

A second consideration is the fact that several recent studies have shown that there is a definite relationship between the level of anxiety in pregnant women

and the incidence of birth complications (eg., Davids & De Vault, 1962., Heinstein, 1967., Nettelbladt, Fagerstrom & Uddenburg, 1976). The relationship indicated is that women who show a bigger increase in anxiety than usual, tend to experience more complications during the birth process. Research has also shown that there is a definite relationship between the frequency and severity of birth complications and the incidence of mental retardation due to anoxia (eg., Sameroff & Chandler, 1975). Therefore there is reason to believe that maternal anxiety is an important contributory factor which can have an inhibitory effect on children's development. In view of this possibility it seems important to attempt to identify the factors during pregnancy which lead to increases in maternal anxiety.

During pregnancy, most women experience some degree of anxiety due to the changed circumstances they now encounter. The pregnant woman experiences a variety of changes in her lifestyle and identity, and even though her desire for the child may have been considerable, she may still experience a certain degree of anxiety. There is also a change in her physical condition which during the early stages of pregnancy especially, may make her feel nauseated and upset. The change in her body size and shape may be difficult for her to adjust to, and may cause her to become anxious and perhaps even depressed. It is widely acknowledged that most women during this time need considerable support from those around them and, in addition,

knowledge about the process of pregnancy and preparation for labour. Many women expect the birth process to be a painful experience and this may also contribute to their anxiety. Partly because of this, many Western countries provide antenatal instruction in an endeavour to teach the woman how to cope with labour, and to provide her with the relevant knowledge that allows her to participate in the process in such a way that painfulness is lessened and more bearable. Such courses typically consist of physiotherapy sessions which give the women specific instruction on how to manage each stage of labour, and some courses are also accompanied by lectures about various aspects of pregnancy and labour. An example of one such course of lectures in Christchurch includes the following topics: Adjustment to pregnancy; parenthood today; babycare; feeding; hospital routines; birth films; and guide to labour.

Such courses endeavour to inform the mother about all aspects of pregnancy and the delivery process, and it is to be hoped that if such courses function effectively, women will gain support and confidence and, as a result, will be less anxious about the pregnancy and birth processes. If this is in fact true, the incidence of women experiencing birth complications due to high anxiety should be less among women attending antenatal classes (or having previously attended such classes) than among those who have not attended such classes.

The present study was concerned with the effects of antenatal classes on the anxiety level of pregnant women. A comparison was made between women who were attending antenatal classes, women who were not attending classes but had done so in the past, and women who had never attended such classes. Intergroup comparisons were also made on the basis of measures of other psychological states eg., fears held for the baby, fears held for self, maternal feelings, desire for pregnancy, irritability and tension, depression and withdrawal, and feelings of dependency. The extent to which degree of disturbance to the sleep patterns of subjects and degree of nausea and vomiting experienced during the pregnancy differentiated women attending antenatal classes from women not attending such classes was also examined. It is acknowledged that a direct relationship between the level of anxiety during pregnancy and the outcome of delivery may be difficult to establish. An extremely large and complex group of factors can influence the course of pregnancy and it seems improbable that attendance or nonattendance at an antenatal course per se could counteract the effect of other influences in the maternal environment. Pregnancy experience is likely to be a potent confounding variable - mothers attending classes for their first pregnancy may well have very different attitudes to those attending classes for their second or third pregnancies and women facing grave financial problems may have very different attitudes toward pregnancy than those who are financially secure, etc.

It would also seem logical to expect different attitudes toward pregnancy from single women than from married women, and (all things being equal) from younger women than from older women. All of these variables and many others eg., degree of support from the husband and family and influence of cultural attitudes toward pregnancy, are factors which cannot be eliminated when considering differences between women who attend classes and those who do not. Consequently, although in the present study an attempt is made to determine whether there is a difference in anxiety levels between women attending antenatal classes and those not attending such classes, the study is also concerned with the possibility that a number of environmental factors may lead to anxiety levels which are higher during pregnancy than would normally be expected. An attempt is also made to determine whether in the absence of any single precipitating factor, there is a set of factors which is common to the environments of highly anxious pregnant women when compared with less anxious women. In other words, the possibility is examined that there is a particular type of environment which is likely to precipitate high levels of anxiety in pregnant women. Assuming such an environment can be identified, the implications for the care and support of pregnant women will be considered. Consideration of this question seems important because as mentioned above, research has shown that women who show greater increases in anxiety during pregnancy tend to experience more birth complications - complications which are

clearly implicated in the incidence of learning difficulties and mental retardation. If the variables in the maternal environment which precipitate increased levels of anxiety can be identified, it may be possible to develop strategies which will minimize the adverse effects of such influences and thus reduce the incidence of mental retardation and brain damage resulting from birth complications.

CHAPTER TWO

LITERATURE REVIEW AND RATIONALE FOR PRESENT STUDY

During recent years, child development researchers have shown considerable interest in prenatal and perinatal development and it has become increasingly obvious that during this period, a large number of developmental aberrations can occur. The most immediate environment for the foetus is the amniotic sac, but it should be noted that there is also direct influence on foetal development arising from the environment external to the uterus. This extended environment includes influences that both directly and indirectly affect the environment of the mother. Due to the considerable extent of environmental influence, the foetus is susceptible to many more sources of influence than were generally realized a decade ago. Probably one of the most devastating examples of environmental influence has been the manifestations of severe illness and cancer in victims of the Hiroshima and Nagasaki bomb disasters. These incidents revealed not only direct environmental effects on normal development, but long-term genetic effects as well. Another major tragedy of potent adverse environmental influence has been the high incidence of malformed

children born to mothers who took the drug Thalidomide during pregnancy.

Since these events occurred, there has been a considerable acceleration of research into the effect of environmental influences on foetal development, particularly with regard to the prevention of mental retardation. To date, research has indicated that maldevelopment or damage to the foetus can result from the influence of factors such as those discussed in the following sections.

Malnutrition and Dietary Intake of the Mother

Koch and Koch (1974) discuss the estimate made by the President's Committee on Mental Retardation (established by John F. Kennedy in the early 1960's), that 50 percent of the women in large urban areas in the United States suffer from protein malnutrition. If this estimate is accurate, there is considerable cause for concern because protein deficiency during pregnancy can lead to intrauterine stunting and impaired brain development which may in turn contribute to mental retardation. If such a high proportion of women are suffering from protein malnutrition, large numbers of children are being placed 'at risk'. A study was carried out on women attending the prenatal clinics of a Boston Lying-in hospital between 1939 and 1941 (Montagu, 1977). The women included in the study followed diets which varied

considerably in nutritional value. The results of the study indicated that "almost all the infants born to mothers on excellent diets were in good or excellent condition at birth, whereas all the stillborn children, all but one of the premature infants, and almost all of the babies who were born with any difficulty at all were born to the women who had been on poor diets." (Montagu, 1977, p.23). A similar finding emerged from a study by Ebbs (1942) in which pregnant women were given supplementary nutrition. These women, all of whom had been on inadequate diets were given varying degrees of supplementation to their diets during the remainder of their pregnancies. Results of the study indicated that women whose diets were considered to be good after receiving supplementary nutrition, experienced very few difficulties during labour and delivery whilst many more women on poor diets experienced difficulties. In addition to this, after birth, children of poorly nourished women experienced considerably more illness during the first six months of life than children of the well nourished women (Montagu, 1977). According to Ebb, one of the most disturbing aspects of the study was that none of the mothers showed any obvious signs of either malnutrition or deficiency themselves.

Naeye, Blanc and Paul (1973) compared autopsies on well-preserved stillborn and newborn infants who had died from unknown causes (i.e., the death could not be attributed to factors such as major congenital anomalies,

infections, etc.). They also estimated the mother's nutritional status by comparing height for weight at various times with standards published by the World Health Organization, and found that underweight mothers had infants with disproportionately low weights for some organs and small cells in the adrenals and liver. They also found that a number of factors such as race, marital status, wanted or unwanted pregnancy, late vaginal bleeding, mother's age, work status during pregnancy etc., had no influence when compensated for by the nutritional factor. A third finding was that successive pregnancies in undernourished mothers led to progressively more undernourished neonates while mothers in the highest nutritional category had successively larger infants. Fourthly, organ and cellular growth was most affected after 34 weeks of gestation and the organ size differential also extended to brain growth.

Caputo and Mandell (1970) in their review of the literature concluded that very low-birth-weight in individuals seems to be associated with significant impairment of intelligence, deficits in physical growth, neurological functioning and motor behaviour, and that there is also an association with subsequent academic achievment, hyperkinesis, accident-proneness and autism. They conclude that prematurity is over-represented in the population of mental retardates - a finding that is also endorsed by Koch and Koch (1974).

These studies all emphasize the importance to

foetal development of a nutritionally adequate and well-balanced diet. It is understandable that women in the under-developed nations could be undernourished, but it needs to be realized that this is also a matter for concern in Western countries. It has been shown in the Scandinavian countries that well-organized programmes of antenatal care can virtually eliminate problems associated with malnutrition. The importance of adequate foetal nutrition has also been recognized in Great Britain where pregnant women are entitled to supplementary vitamin and iron tablets, and rations of milk provided under the National Health Scheme - a procedure which seems more advantageous to society in the long run than having to provide special education and institutional care for mentally retarded children.

Infections

Probably the best known infection to affect foetal development is congenital rubella. Koch and Koch (1974) note that the most vulnerable time for the foetus to be affected by this disease is during the first month of pregnancy. At this stage there is a 50 percent risk of the child being adversely affected. The risk reduces to 22 percent during the second month of pregnancy and to 6 percent during the third month. According to Dudgeon (1976), the consequences of foetal infection by rubella vary considerably and include: spontaneous abortion,

stillbirth, congenital defects and disease in infancy. Apparently, is is sometimes the case that a child affected by rubella may be apparently normal at birth but develop hearing problems later in childhood. Other major viral infections that can occur prenatally include: Cytomegalovirus - a disease which can also be present in children who appear to be normal at birth but later show manifestations of microcephaly, failure-to-thrive, and psychomotor retardation; Herpes simplex - a virus which when transmitted to the foetus is similar in its effect to cytomegalovirus, and can result in microcephaly, cerebral calcifications, chorioretinitis and mental retardation, and in some cases, malformation of the central nervous system. There are also other non-teratogenic viruses such as varicella (chickenpox), toxoplasmosis and herpes zoster which have been implicated in congenital and perinatal infections (Dudgeon, 1976; Robinson & Robinson, 1976). There is some debate as to whether mumps and influenza affect the foetus but no doubt at all about the potential danger of syphilis to the foetus. Intrauterine infections such as maternal urinary infections can also cause problems. If optimal conditions for the developing foetus are to be maintained, it is essential that good antenatal and obstetric care are available to all pregnant women so that the incidence of the above-mentioned infections can be minimized.

Medication and the Use of Drugs during Pregnancy

Since the thalidomide disaster there has been considerable research into the effects of drugs on foetal development, and many have been found to have associations with specific deformities or effects. Davis (1976) lists the associations for the known teratogenic drugs including aspirin, which is known to have been associated with cleft palate. Davis does note however, that for most of the teratogenic agents, the adverse effects are in relation to populations rather than individuals so that they are associated with increased incidence of congenital malformations in groups without increasing the risk greatly for the individual (Davis, 1976). Part of the problem is that many women fail to realize that any drug having an effect on them may have a far greater effect on the foetus because of the considerable difference in body mass. It is not always possible to generalize from studies carried out on animals to effects on humans, but one study was undertaken using mice to estimate the effects of drugs in relation to body weight (Montagu, 1977). During this study, the dose of the drug (a sleep-inducing preparation) given to the mice was fixed according to the body weight of each animal so that each animal received 10mg. for each kg. of body weight. (Since mice weigh only a few grammes, the dosage for each animal was very small.) As a result of this procedure, adult mice went to sleep

and slept for 5 minutes. The same dose in proportion to their body weight caused 7-day old mice to sleep for 107 minutes and 1-day old mice slept for 360 minutes. If the results of this study could be validly generalized to humans, it could possibly mean that women taking drugs during pregnancy could be exposing the foetus to far greater dosages of those substances than would be considered safe, depending on how much is actually transferred via the placenta. The likelihood of adverse reactions to maternal medication does depend however, on the stage of development the foetus has reached. For instance, each organ has a critical period during which its development may be affected. The critical period for the central nervous system extends from the beginning of the third week of development until birth, but the most sensitive time is during the third to fifth weeks of embryonic development. In contrast, the critical period for the development of the palate extends from the end of the sixth week of development until the end of the twelfth week of development (Moore, 1973). However, the general principle applies that the earlier part of these critical periods is the most sensitive time for the potential effects of adverse influences. This confirms findings by Lucey (1965), that certain drugs which do not have a great effect on the older foetus may permanently alter development if encountered in the first few weeks of life.

Stern (1966) found that pregnant women using heroin

had significantly fewer term deliveries, significantly more premature infants, and experienced a significantly greater incidence of toxaemia, abrupto placentae, post-partum haemorrhage and breech presentations, than other pregnant women who were not chronic heroin users but were admitted to the hospital during the same period. Bowes, Brackbill, Conway and Steinschneider (1970) have provided an exhaustive review of research relating to the effects of obstetric medication on the foetus. The studies reviewed range from the staining of deciduous teeth by the administration of Tetracycline to the mother, to the production of congenital anomalies by cancer chemotherapeutic agents. The authors of this review note that although in many instances the drug reaches the foetus in a relatively unchanged form producing its effects in a similar manner to those produced in adults, it is also true that some drugs produce their effects on the foetus in a changed form, possibly through the mediation of a metabolite. It is also possible that drugs may affect the foetus by altering the maternal physiology and consequently the intrauterine environment. Haire (1976) has stated that there is no drug which has been proved to be perfectly safe to the unborn child and that one of the difficulties is that although there may be no apparent immediate effects from the administration of the drug, it is not possible to rule out such long-term adverse effects on development as those that may be responsible for learning disabilities or hyperactivity.

Smoking and Lack of Oxygen

Montagu (1977) and Meade (1976) cite several studies which have found an association between maternal smoking and infant prematurity or low-birth-weight. It has become apparent that even if the smoker does not actually inhale, smoke still enters the bloodstream via the mucous membrane of the mouth and throat. Apparently, tobacco smoke contains many substances such as nicotine, carbon monoxide, methyl alcohol, carbonic acid, arsenic, and various other substances such as a number of tar products. Such substances can all be conveyed to the foetus via the placental blood supply. Haire (1976) argues that when the mother smokes only one cigarette, the foetus is left "panting for breath" for up to 90 minutes after the cigarette has been smoked. It would thus appear that for each cigarette smoked, the foetus suffers some degree of oxygen deprivation for a considerable time afterwards. Another hazard of smoking is that of radio-activity. Montagu (1977) discusses an announcement made by Radford and Hunt (January, 1964) that tobacco smoke had been found to contain the radioactive Polonium-210. Apparently this substance can be carcinogenic and can attach itself to smoke particles, pass into the bloodstream, and cross into the bloodstream of the foetus via the placenta. Since the polonium disintegrates slowly, its cumulative effect can be serious.

On the basis of preliminary results from the

Christchurch Child Development Study (1978), the Christchurch Clinical school has observed that women smoking more than 20 cigarettes a day were more prone to miscarriage than other women - a trend which could not be explained by other factors such as age of mother or parity.

There are many other physical influences and aspects of the maternal environment which can detrimentally affect the foetal development (maternal injury, X-ray radiation, age of mother etc.,)and these require treatment and/or preventive strategies. In recent years, the importance of the psychological adjustment of the mother as an influence on foetal development has also been increasingly recognized. More detailed attention will thus be given to research in this area of maternal health.

Emotional Stability and Stress

During periods of strong emotion, physical and chemical changes occur in the body as chemical substances are manufactured by the nerve endings and hormones are released by the endocrine glands. It is conceivable that if the pregnant woman undergoes a period of considerable emotional arousal, the end result could be that undesirable (and presumably harmful) quantities of these chemical substances and hormones could pass across the placenta into the circulatory system of the foetus.

Over the past 20 years, a large body of research has focussed on the emotional state of the pregnant woman, the relationship between emotional state and physical state during pregnancy. and the possible reltionship between emotional states during pregnancy and the outcome of labour.

McDonald (1968) reviewed the literature relating to emotional factors and obstetric complications, and noted three important characteristics of pregnancy: - normal physiological adaptations, psychological adaptations, and changes in the family unit. He noted that a normal pregnancy occurs when there is apparent harmony between the physiological changes and the psychological adaptations. Many of the studies undertaken have examined the possibility that anxiety and subsequent birth difficulties may arise when the balance between physiological and psychological changes is out of phase.

There is considerable debate about the cause of nausea and vomiting during pregnancy. Such a large proportion of women experience nausea during pregnancy, especially in the early months, that many authorities regard nausea as being just one of the normal physiological manifestations of pregnancy. An alternative view is that nausea may be a manifestation of emotional factors. McDonald (1968) found conflicting opinions in this matter. Some authorities had argued that vomiting in the latter stages of pregnancy represented an unconscious rejection of pregnancy, whilst others maintained that vomiting was due

to feelings of ambivalence rather that outright rejection of the pregnancy. One study found a significant relationship between vomiting and high anxiety levels. Research in this area was also reviewed by Wolkind and Zajicek (1977) who also found conflicting views on the relationship between vomiting and pregnancy. These authors examined the view that it is the symptom-free pregnancy which should arouse concern, for in these cases, the pregnancy is being denied. Support for this view was also obtained by Uddenburg, Nilsson, and Almgren (1971), who found that symptomless women were more likely to encounter difficulties during pregnancy and to have problems of adjustment than women who experienced moderate nausea. A number of studies (Wolkind & Zajicek, 1977) suggest that prolonged vomiting may be associated with high levels of stress due to physical and social difficulties.

The evidence seems to suggest that vomiting and nausea are normal physiological reactions to pregnancy at least during the first three months (having a definite endocrinologic basis) but that prolonged vomiting in the later stages of pregnancy may be an indication of an undue stress due to the loss of harmony in the interaction between physiological and psychological or social factors. McDonald (1968) argues that anxiety is caused by unresolved conflicts about pregnancy, and that if the anxiety is prolonged, attempts to adjust to it fail resulting in Autonomic Nervous System activation, and complications. The role of social factors as contributors to stress is

borne out by a study undertaken by Davids and Rosengren (1962). These writers found that women who were dissatisfied with their social status were less happy about their pregnancy and were more anxious and more emotionally maladjusted than women who did not share their dissatisfaction.

Helper, Cohen, Beitenman and Eaton (1968) investigated the types of stress faced by pregnant women and found that events in their environments could have a discernible influence on their adjustment to pregnancy. Two situations were found to be particularly threatening to pregnant women - rejection of the pregnancy by the father of the child, and the experience of previously giving birth to a defective or seriously disturbed child. Women who had experienced these difficulties would almost certainly be concerned about their present pregnancies but it should also be noted that difficulties in adjusting to pregnancy are not always related to such obvious causes.

During recent years, it has become increasingly apparent that the attitudes and psychological reactions of pregnant women exert an important influence on the extent to which they subsequently experience difficulties with childbirth. Since it has also become apparent that the attitudes and psychological adjustment of pregnant women can, to a certain extent, be influenced by the quality of care the women experience during pregnancy, it seems that more attention should be given to the identification of 'at risk' pregnant women so that they can be helped to make a better adjustment to their

pregnancy and birth experiences. Such a course of action could possibly lessen the incidence of birth complications and subsequent mental retardation in children.

Several investigators have considered the question of events relating to birth complications. Davids and De Vault (1962) undertook a study of anxiety in pregnant women, most of whom were in the third trimester of pregnancy. The women were assessed on a variety of measures of personality to ascertain their current level of anxiety and this was related to the extent of abnormalities and difficulties experienced in the subsequent childbirths. The results indicated that women who subsequently experienced difficulties during childbirth were markedly more anxious during pregnancy than women who did not experience difficulties during childbirth. It needs to be noted however, that the researchers did not investigate the causes of the increased levels of anxiety. It is possible that women who are more anxious during pregnancy may already be experiencing more difficulty with their pregnancy than less anxious women and that it is the difficulties which are precipitating the increased anxiety. Heinstein (1967) examined this possibility. An attempt was made to gain an understanding of the attitudes and feelings of women during pregnancy, and to relate these to physical complications of pregnancy, labour and delivery. Assessments were made of each subject's medical history, family socio-economic status, medical history of close relatives, course of pregnancy, labour and delivery,

and an examination of the neonate. Women were also asked to complete Schaefer and Manheimer's (1960) Pregnancy Research Questionnaire (PRQ). The results indicated that the following scales included in the PRQ were affected by socio-economic factors: Psychosomatic Indicators of Anxiety during Pregnancy; Problems of Menstruation; Fears for Self; Desire for Pregnancy; Dependency: Fears for Baby; Irritability and Tension; and Maternal Feeling. It was also found that certain attitudes and feelings reflecting general moodiness, depression and overdependency were significantly associated with physical complications of childbirth. Rejection of pregnancy tended to be associated with higher levels of anxiety, depression, dependence, unhappiness in marriage, and attitudes which reflected sexual maladjustment. It was noteworthy that "the more negative the sexual attitudes, the more likely was the gravida to experience a spectrum of psychological and physiological problems during pregnancy." (Heinstein, 1967, p.234). This study also emphasized the fact that it is not possible to determine whether the subject's psychological states were influenced by the physical states or whether the physical problems were causing the psychological reactions. In fact, it seems probable that considerable interaction occurs between the two.

Breen (1975) obtained results which were contrary to those of the previous study. In her investigation,

subjects were tested with various measures and divided into groups according to their apparent adjustment to pregnancy. The results indicated that the women who were apparently well-adjusted had a higher depression score than the ill-adjusted group. The results indicated that women who were anxious, or rather, who expressed their anxiety during pregnancy, subsequently had fewer difficulties with the birth experience. These findings are consistent with those obtained in the previously mentioned study of Uddenburg et al (1971). A further study by Uddenburg, Fagerstrom, and Hakanson-Zaunders (1976) of women who had relatively normal deliveries was concerned with the relationship between the mental adaptation of the women and the duration of labour. The findings of this study indicated that women who admitted to a lot of symptoms during pregnancy were actually handling their conflicts at a conscious level. Women who appeared to be experiencing conflicts but admitted to few symptoms during pregnancy tended to have protracted labours; women who gave signs of conflicts and a high number of symptoms tended to have relatively short labours, whilst women who showed no signs of conflict tended to be intermediate in time of labour and the length of labour appeared to bear no relation to the numbers of symptoms reported. The authors concluded that helping women to admit to and express their conflicts and anxieties toward pregnancy should help to reduce the incidence of prolonged labour.

Nettelbladt, Fagerstrom and Uddenburg (1976) found that a woman's attitudes toward pregnancy and motherhood also influenced her perception of the intensity of pain experienced during pregnancy. Women who were anxious about childbirth during their pregnancies, reported more painful deliveries than others and were unable to control their behaviour during contractions or to relax during labour. As the authors suggest, these findings fulfill Read's prediction of a Fear-Tension-Pain syndrome (discussed in a subsequent section).

Clifford (1962) examined attitudes toward pregnancy expressed by married and single women. It was found that single women expressed relatively fewer complaints about pregnancy than married women and the author suggested that this may reflect feelings of guilt and a perception of physical difficulties of pregnancy as punishment, with the single women tending to suppress recognition or mention of their difficulties in order to alleviate their guilt feelings.

Erickson (1976) examined the influence of physical factors on the psychological status of pregnant women. The instrument used in this study was Schaefer and Manheimer's (1960) PRQ, and a comparison was made between Primigravidae and Multigravidae. The results indicated that primigravidae tended to be more afraid for themselves and the baby than multigravidae, and that the stronger these fears were during pregnancy, the more complications they tended to experience. In contrast,

multigravidae were more subject to mood changes expressed by irritability and depression. The author suggested that the results could reflect the fact that primigravidae are facing an unknown situation whereas multigravidae have already experienced childbirth and are more likely to be affected by demands made on them by the family they already have.

Some investigators have extended their research to consider the relationship between attitudes during pregnancy and postnatal events. Ottinger and Simmons (1972) found a significant difference in the crying behaviour of the babies of mothers who were highly anxious during pregnancy. The babies of these mothers cried significantly more, prior to feeding than the babies of less anxious mothers. The researchers found that the results favoured a prenatal and/or genetic phenomenon rather than any difference in handling of the babies by their mothers. Doty (1967) found a significant relationship between social class and attitudes toward the pregnancy. In general, lower class women, and in particular, multiparae, were more rejecting of the maternal role and pregnancy, and admitted to more emotional disturbance than other women in the study. It was also found that negative attitudes toward the pregnancy were associated with more reports of infant behaviour problems than were given by women with more positive attitudes toward pregnancy. This generalization however, could not be made for those lower class women who expressed the most negative attitudes.

This group reported the fewest infant behaviour problems and the suggestion was made that although there could be a real class difference in this respect, it could also be the case that lower class women in this study in comparison with other multiparae are actually less attentive to, or more repressive of, the types of behaviour in question.

Huttenen and Niskanen (1978) also investigated the area of prenatal influences on postnatal behaviour. Their sample consisted of psychiatric patients whose fathers had died before they were born, and these patients were contrasted with a group of people who had lost their fathers very early in postnatal life. The results of the study indicated that there were significantly more people with behaviour disorders in the prenatal loss-of-father group than in the early postnatal loss group, but because of the small sample size and other methodological shortcomings, the authors considered that the results could not be regarded as conclusive.

These studies appear to support the suggestion that the chemical changes occurring in the pregnant woman during times of stress have some long-term effects on the foetus which manifest themselves in behaviour differences after birth. Mention has been made previously that during periods of stress and strong emotion, increased activity occurs resulting in the release of hormones by the endocrine glands and chemical substances by the nerve endings. It is conceivable that if this increased level of activity continued for a considerable time, there could be an

accumulation of the chemical substances and hormones in the mother's circulatory system. Since the maternal circulatory system is directly linked to that of the foetus via the placenta, the result could be that the foetus is exposed to chemical substances and hormones in concentrations sufficient to adversely affect its development. The effect of such substances may not necessarily be manifested by congenital deformities or mental retardation, but could be indicated by postnatal behaviour disorders.

Antenatal Courses and Education for Childbirth

The realization that attitudes toward pregnancy and childbirth can affect the labour and delivery experiences, has brought with it the realization that it may be possible to influence these attitudes by education for childbirth.

One of the earliest advocates for childbirth education was Dr Grantly Dick-Read. During his years of medical practice, he noted that not all women suffered painful deliveries, in fact some of his patients had extremely painless, comfortable "natural" deliveries. He observed that women who experienced painful deliveries were often also very much afraid of childbirth - a pattern he described as a Fear-Tension-Pain syndrome.

> "Pain in an otherwise uncomplicated labour arises from the activation of the sympathetic nervous system by the emotion of fear. Fear produces within the uterus excessive tension which causes pain and is rightly interpreted as such by the

> integrating nuclei of the thalamic area. Fear induces restriction of the circulation of the blood through the uterus, thereby limiting in many ways the efficiency of the mechanism of parturition, adding to its discomforts the exquisite muscle tenderness of ischaemia." (Snaith & Coxon, 1969, p.64.)

He maintained that by removing or eliminating the fear, tension would be reduced and consequently the pain also reduced. He believed that one way to achieve this end was to educate the mother for the process of childbirth so that she would be aware of the natural process and therefore be able to participate in and assist the natural process. By understanding the process and the changes likely to occur during the delivery experience, the mother would be more confident in her ability to cope with the experience.

Most courses of childbirth education in Christchurch provide physiotherapy classes at which the women are taught various exercises and techniques of breathing so that they can cope with the stages of labour without undue tension. It is not suggested that all women trained for natural birth will have a birth experience without pain. For many there will be pain concomitant with labour, but what can be changed is the woman's perception of pain. If the woman has been adequately prepared for the birth experience, she can participate in the experience instead of fighting against it. Since anxiety also gives rise to tension and is often a manifestation of fear, it follows

that by reducing anxiety, one interrupts, or better still, eliminates the Fear-Tension-Pain syndrome. This view is supported by Dilworth (1975) who maintains

> "The classes are an ideal opportunity to dispel any fears which may be present, caused by superstition or the woes of well-meaning friends and relatives. A familiarity of the surroundings where the mother is to have her baby is very helpful. She's then not apprehensive of a strange place when she arrives. I try to achieve this by having the ante-natal classes actually at the home and demonstrating baby care in the rooms where she is to be nursed.
>
> The majority of mothers are apprehensive to begin with - they need their confidence built up to know that although their labour may in some cases be a fairly painful process, they can cope beautifully with practice."
> (Dilworth, 1975, p.7.)

Dr Earle Wilson of the Department of Obstetrics and Gynaecology, Otago University, also emphasizes the importance of good antenatal care and antenatal education. He argues

> "Labour is generally uncomfortable. The degree of discomfort varies from woman to woman, from community to community, from cultural pattern to cultural pattern. Some women may overtly express a great deal of pain in labour. We all have different thresholds at which we feel pain and this threshold varies between individuals....
>
> What ways have we of overcoming the discomfort of labour? First, ante-natal education - only recognized as such for about 100 years, whereas some principles of the care of labour and delivery have been known for very much longer. It has been clearly shown that good antenatal education can reduce the need for pain relief during labour. Perhaps because many of the fears of labour, and there are fears, especially about the first

> labour, obviously potentiate the feeling of discomfort and pain. Good ante-natal education can do much to remove many of these fears. Good physiotherapy, the learning of techniques of relaxation, breathing, and control will do a lot to remove the necessity for a large amount of pain relief." (Wilson, 1975, Pp.17-18.)

To date, the research in this area appears to be sparse, but one study to appear in recent literature is that undertaken by Zax, Sameroff and Farnum (1974). This study compared two groups of women who were attending childbirth education classes plus a control group of multiparous women who were delivering at the same hospitals as the experimental groups but were not taking part in childbirth training programmes. The experimental subjects were taking part in a Lamaze training programme for childbirth preparation. The test used to measure anxiety was the IPAT anxiety scale. The results failed to show that the Lamaze programme had reduced anxiety in the expectant mothers, a result which could be in part due to the fact that the IPAT scale measures trait anxiety rather than state anxiety attributable to pregnancy. However, the results did show that trained multiparae required less premedication than control multiparae and that both trained multiparae and primiparae required less general anaesthesia than did the hospital controls. This seems an important result for it is maintained by many investigators that medication and anaesthesia can contribute to anoxia in the baby. The point is discussed in detail by Seeds (1970) who notes that drug or anaesthetic

gas can result in depression of respiratory and other central nervous system functions that do not become apparent until after birth.(p.828.)

A study by Klusman (1975) was also concerned with the effects of childbirth education. A comparison was made between two different types of antenatal courses - one organized by the Childbirth Education Association, and the other by the Red Cross. While the Red Cross classes were apparently concerned with babycare and with the dissemination of straightforward information about labour and delivery, the Childbirth Education classes were concerned mainly with labour and delivery. In the Childbirth Education classes the women were taught exercises and breathing techniques to use during labour. The results indicated that both types of courses reduced two types of pregnancy-related fears, Fears for Self and Fears for Baby (measures derived from Schaefer and Manheimer's PRQ), but the results from the IPAT anxiety scale showed a reduction in the Childbirth Education group only. This finding, however, could well represent a regression artifact since the women in this group had higher levels of anxiety to start with. This differential raises the possibility that a process of "natural selection" is occurring. It may be the case that women who attend courses which focus on Lamaze-type methods of childbirth training are generally more anxious than those women who do not. Klusman's study did not involve a group of women who were not attending prenatal classes at all,

so that it was not possible to ascertain whether or not women attending classes differed from those not attending in levels of anxiety.

In brief, research to date suggests that during the prenatal period, development is susceptible to influence from many factors - physical, social and environmental, which can contribute to abnormal development. It has also become apparent that psychological and emotional stresses in the environment of the mother can also have detrimental effects on the development of the foetus. The question which has arisen is whether it is possible to reduce the incidence of psychological and emotional upset in the mother (particularly if they are related to pregnancy) by exposing her to education for labour and childbirth. To date, results from research undertaken is not conclusive for it is difficult to isolate factors relating only to the pregnancy experience from factors arising from the external environment of the mother. However, if the effect of antenatal classes is to be thoroughly examined, it is important to consider two questions:

(a) What information is actually transmitted to mothers during antenatal courses?

(b) What are the characteristics of women who attend antenatal classes compared with women who do not attend?

Research to date also suggests that one significant factor in the adjustment of the pregnant woman which is detrimental to foetal development and perinatal well-being

of the infant, is the presence or absence of maternal anxiety. Anxiety is especially influential during the labour and delivery experience because it appears to precipitate tension in the mother and subsequent birth complications. It seems highly desirable therefore, to reduce anxiety in pregnant women.

Rationale for the Present Study

The present study was concerned with the anxiety levels of women attending prenatal (antenatal) classes and those not attending such classes. An attempt was made to see whether there was a real difference in the anxiety levels of women in these groups and a close examination was also made of various characteristics of pregnant women which could contribute to anxiety and related psychological measures.

In the preliminary phases of the present study the researcher had extensive discussions with the doctors and officials who were administering the various courses in Christchurch. While written documentation of the rationale for such courses was not available, the belief was consistently expressed by the doctors and officials that women who have been prepared adequately for the birth experience, who know what is likely to happen, and who know how to respond, are likely to be less apprehensive about the experience and to have fewer problems during the experience. It seemed conceivable therefore, that women who

were attending antenatal classes would be less anxious about their pregnancies and about the forthcoming labour and delivery than women who were not attending and had never attended, such classes.

The present study was designed to investigate whether or not women attending antenatal classes were less anxious than women who were not attending antenatal classes. Two hypotheses were formulated:

Hypothesis 1. Women who are attending an antenatal course will be less anxious than women who are not attending such a course.

Hypothesis 2. Women who are not attending an antenatal course but have in the past, will be less anxious than women who have never attended such a course.

It is recognized that the examination of these hypotheses is extremely difficult. There is a vast array of influences in the pregnant woman's environment apart from antenatal classes, and it is extremely difficult to accommodate such influences in the research design. The accommodation and examination of such influences entails an analysis of the type described by Bronfenbrenner (1977) in his argument for an "experimental ecology of human development". For Bronfenbrenner, the form of such an experimental ecology is:

> "the progressive, mutual accommodation throughout the life span, between a growing human organism and the changing immediate environments in which it lives, as

> this process is affected by relations obtaining within and between these immediate settings, as well as the larger social contexts, both formal and informal, in which the settings are embedded.... The ecological environment is conceived topologically as a nested arrangement of structures, each contained within the next." (p. 514.)

The structures or systems are viewed as progressing in complexity and generality. The most immediate system, the microsystem, concerns the relations between the person and his/her immediate setting such as the home, school etc., and the other participants included in those particular settings. Superimposed on the microsystem is the mesosystem which concerns the interrelations between microsystems, and exists within an exosystem consisting of social structures that do not themselves contain the person, but do influence the immediate settings of the individual. Bronfenbrenner's examples of the exosystems include the mass media, agencies of government, the distribution of goods and services, the world of work, etc. His final system is the macrosystem which includes the whole network of cultural patterns and ideologies, the economic, social, educational, legal, and political systems all of which have manifestations in the micro-, meso- and exosystems.

According to Bronfenbrenner (1977), the principle objective of the ecological experiment is to discover the processes that are occurring within and between these systems in relation to the developing individual, rather

than the direct testing of hypotheses, and consequently, the principal data trends are likely to be interactions.

It is from this "ecological" point of view that the present study has been undertaken. Although the main aim was to see whether women going to antenatal classes were less anxious than those who were not, it was apparent that many other variables would also affect anxiety levels. For this reason the Background Information Questionnaire was incorporated in the study. The questionnaire provided information on the level of education a subject had attained, the nature of her home situation, the extent of support she obtained from her family and friends, and whether such factors influenced her adjustment to pregnancy. The questionnaire also provided an indication of the subject's socio-economic status as well as the extent of her involvement in antenatal classes (presently or previously). While the information obtained does not provide complete descriptions of the environments of the pregnant subjects, it was hoped that it would provide a useful indication of influences on the subjects beyond the immediate situation containing the subjects. (Bronfenbrenner, 1977, p.514).

CHAPTER THREE

METHOD

General Design

The present investigation was essentially exploratory in nature. Although the intention was to examine the relationship between anxiety levels in pregnant women and their attendance or non-attendance at antenatal classes, it was realized that many other factors which affect the mental health of a pregnant woman (and might contribute to attendance or non-attendance at such classes), could exceed the influence of antenatal classes per se on the anxiety level of the women concerned. Accordingly, an attempt was made to include as many of such variables as possible in order to assess the environmental or "ecological" background of the subjects. In Bronfenbrenner's (1977) terms, the present study represents an attempt at ecological description rather than merely prediction per se.

Subjects

It was decided to approach all medical centres or group medical practices in Christchurch to gain access to their pregnant patients. Since it was not possible to approach all individual doctors in the city, it appeared that the largest concentration of subjects could be

reached by using medical centres. Names of these were obtained either from the telephone directory or from the Health Department. Unfortunately, at least two centres from the outer suburbs were not approached because they were not listed in the directory. Of the 14 centres approached however, 13 agreed to participate and it was considered that these centres provided an adequate representative coverage of the Christchurch metropolitan area - both in terms of geographical distribution and socio-economic representation. All doctors within the centres were requested to invite all pregnant women who were included in their caseloads during the survey period (mid-June to August 31st, 1977), to participate in the study - regardless of the particular stage of pregnancy the patient had reached and regardless of whether or not it was their first pregnancy. As a result of this procedure, 312 women agreed to participate in the study. Because in most instances the doctors or their practice-nurses approached the subjects, the number and characteristics of those women who declined to participate could not be established. Several doctors, however, mentioned the fact that numbers of pregnant women in their caseloads were considerably lower than in the previous year (in some cases as much as 50 percent) - a fact which they attributed to a drastically declining birth rate. This would certainly explain the fact that only 312 subjects were obtained from these centres, whereas doctors' estimates based on 1976 figures suggested a sample size of 500 or more.

Instruments

A series of three questionnaires (Appendix B) was used in the study. The three questionnaires were:

(i) Background Information Questionnaire (BIQ);

(ii) Pregnancy Research Questionnaire (PRQ); and

(iii) Antenatal Course Evaluation.

Background Information Questionnaire.

The BIQ was devised to provide information about the subject's environment including such questions as attendance at an antenatal course, her age, her husband's age, the amount of education she had experienced, her occupation, the number of children in her family, questions relating to support from the immediate family and friends etc. The subjects' answers to these questions provided information on factors other than attendance at antenatal classes which might have influenced anxiety levels during pregnancy.

Pregnancy Research Questionnaire.

The PRQ is a questionnaire devised by Schaefer and Manheimer (1960) to assess the adjustment of women during pregnancy. The questionnaire is divided into four sections. Section 1 deals with Health Problems during Pregnancy and consists of three scales: a) Psychosomatic Indicators of Anxiety (throughout this study this scale is referred to simply as Anxiety during Pregnancy); b) Sleep Disturbance; and c) Nausea, Vomiting and Upset Stomach (referred to in this study as Nausea). Section 2 is concerned with Health

Problems before Pregnancy and Section 3 with Problems of Menstruation. However, the scores from the latter two scales were not used in the present study as they did not seem of central relevance to the main aim of the study. The final section of the PRQ, Section 4, was concerned with Psychological Reactions to Pregnancy, and consisted of seven scales: a) Fears for Self; b) Desire for Pregnancy; c) Dependency; d) Fears for Baby; e) Irritability and Tension; f) Maternal Feeling; and g) Depression and Withdrawal.

Antenatal Course Evaluation.

This short questionnaire was completed only by those women who attended an antenatal course. The questionnaire consisted of a series of questions about the particular course the subject had attended, in light of the labour and delivery experience she subsequently had. The questions were designed to estimate the extent to which the women felt themselves to have been prepared for labour and delivery.

Procedure

Four methods were used for distributing the questionnaires:

a) practice nurses gave the questionnaires to subjects as they attended for their appointments;

b) a research assistant was obtained from a university advanced undergraduate education class to help distribute the questionnaires. She attended one of the major clinics

during surgery hours and gave the questionnaires to subjects as they attended for their appointments;
c) questionnaires were delivered to subjects in their homes by the researcher and research assistant; and
d) questionnaires were posted to subjects.

Where possible, methods (b) and (c) were used. However, as they proved to be time-consuming and inefficient, they were replaced by method (c).

Subjects were requested to complete the questionnaires at home and to return them in the stamped-addressed envelope provided. As a result of this procedure, 258 (82.69%) subjects returned questionnaires that could be included in the analyses. Five subjects completed the questionnaires after their babies were born, and were therefore excluded from the study. There were also two other reasons for the loss of subjects. In some cases, subjects' babies arrived before they had time to complete the questionnaire, while other subjects had changed addresses from those registered in the medical centre records and had not left forwarding addresses.

Each subject was given a code number so that anonymity could be maintained. The first digit of the code number indicated the month of pregnancy reached. The other identification data at the top of the questionnaire were also coded to preserve anonymity.

Initially all subjects received the BIQ and PRQ, but the Antenatal Course Evaluation was sent after the predicted birth-date of the baby to all subjects who

indicated that they were attending an antenatal course or that they were not attending one at the time of answering the BIQ and PRQ but intended to do so later in the pregnancy. Consequently, the Course Evaluation was sent to 150 subjects, of whom 23 returned it uncompleted because either they had not attended a course after all, or alternatively, they had not attended enough sessions to feel able to make a fair evaluation. Of the remainder, 73 (57.48%) returned a completed form.

Scoring Procedure

Background Information Questionnaire. Where possible, information from this part of the questionnaire was incorporated directly into the analyses, but where this was not possible, the answers were coded in a form that could be subjected to statistical analysis. At the time the questionnaire was being distributed, it was apparent that the economic situation in New Zealand was deteriorating seriously with an increase in unemployment and a steadily increasing price structure in every sphere. It was also apparent that the economic situation would probably affect some families more than others and would therefore have a greater effect on the level of anxiety in some women more than others.Since there was no item in the questionnaire which specifically asked the level of income of the subject's household, and since more factors contribute to financial hardship than just the

amount of money earned each week, it seemed necessary to estimate the degree of hardship being experienced by subjects. The Comfort Scale was devised to accommodate these needs. This scale took into consideration several questions in the questionnaire and on the basis of the answers to these questions, placed the subjects in one of three groups - Comfort Level 1 (i.e., financially insecure - families apparently suffering considerable financial hardship), Comfort Level 2 (i.e., financially secure - families who appeared to be financially comfortable), and Comfort Level 3 (i.e., financially very secure - families who appeared to be wealthy or at least "very well off"). The questions used to classify the subjects included the following:

Age___Husband's Age___Age at Marriage___

If you are single, do you intend to keep the baby?

Occupation___Husband's Occupation___

Have you worked during this pregnancy?

Ages and Sex of your Children.

I did not want to have a baby at this time

Strongly agree___Mildly agree___

Mildly disagree___Strongly disagree___

I tried to keep from becoming pregnant

True___False___

This was the wrong time for me to have a baby because of: Money problems___Housing___

problems___I did not want to leave my work___etc.

Age, husband's age, and age at marriage were incorporated in the Comfort Scale because it was felt that there could be large differences in the incomes of people in different age brackets. For instance, couples married recently at a young age may not have accumulated savings to the same extent as couples who have been married for ten years. Also, the question would assist in more accurate classification of families whose bread-winner was in the same occupation, eg., a 28 year old accountant would probably be on a better salary than a 21 year old accountant. The question "Have you worked during this pregnancy?" was also included to assist in the estimation of financial resources. "Ages and sex of your children" was included to estimate family size and possible level of financial commitments. The final three questions were included because they directly indicate whether the baby was wanted at the time of answering the questionnaires, and if not, the reasons why it was not wanted.

All subjects were rated independently on these questions by two raters and an assessment was made of inter-rater reliability. An initial sample of 20 subjects was rated on the above questions and agreement of 85 percent was achieved by the two raters, thus indicating a reasonably high level of classification

reliability. The rest of the sample was assessed on this basis. In cases where the raters did not agree on an assessment, the cases were discussed and subsequently reassessed. In the final analysis there were no cases that could not be agreed upon, and it was found that any disagreements were almost entirely due to difficulty in deciding whether particular subjects were "Comfortably off" or "Very Comfortable". There was virtually no difficulty in deciding when a subject should be placed in Comfort Level 1 (financially insecure). As a result of this procedure, the final numbers in each group were:
Comfort Level 1 (N = 44); Comfort Level 2 (N = 165); and Comfort Level 3 (N = 45).

Predictor Variables. The predictor variables were derived from information supplied in the BIQ and included the following variables: Months (of pregnancy), Antenatal Course Attendance, Gravida Status, Woman's Age, Husband's Age, Age Wed, Education, Husband's SES, Woman's SES, Number of Male Children, Number of Female Children, Total Number of Children, Age of Oldest Child, Age of Youngest Child, Number of Miscarriages, Mean Week of Miscarriage, Family in Locality, and Parents Living. (These variables are described more explicitly in the Definitions section which follows.)

Dependent Variables. The dependent variables were measured

directly by the Pregnancy Research Questionnaire (PRQ), and included the following variables: Anxiety during Pregnancy, Sleep Disturbance during Pregnancy, Nausea, Fears for Self, Desire for Pregnancy, Dependency, Fears for Baby, Irritability and Tension, Maternal Feeling, and Depression and Withdrawal. (These variables are also described more explicitly in the Definitions section.)

Pregnancy Research Questionnaire. This part of the questionnaire was scored according to the procedure devised by Schaefer and Manheimer (1960). Tables 1 and 2 indicate the particular items which were included in each of the 10 scales used. Examples of the types of questions used in the various scales have been included in the Definitions section (below). Following Schaefer and Manheimer's procedure, "Health Problems during Pregnancy" were given weightings according to the particular response made to specific questions.('Often' is given a weighting of 4, 'Sometimes' - 3, 'Rarely' - 2, and 'Never' - 1.) It is apparent that there can be no score of zero since the minimum weighting is always 1. "Psychological Reactions" are scored in a similar manner except that the weightings vary more. (The scoring key for this part of the questionnaire is presented in Table 22 - Appendix B). Since the various scales have different numbers of items in them, not only the baselines differ but so also do the ranges and maximum scores. All scales, however, are consistent in that the higher the subject

Table 1

Details of the Items included in Each Scale of Section 1 of the Pregnancy Research Questionnaire

Health Problems during Pregnancy			
Psychosomatic Indicators of Anxiety (i.e., Anxiety during Pregnancy)		Sleep Disturbance	Nausea
1	22	1	5
2	25	11	20
3	26	45	24
6	27		
7	28		
8	29		
9	30		
10	32		
11	33		
12	34		
13	35		
14	36		
15	37		
16	38		
17	40		
18	41		
19	45		
21			
Maximum Total Score	140	12	12

Table 2

Details of the Items included in Each Scale within Section 4 of the Pregnancy Research Questionnaire

Psychological Reactions to Pregnancy						
Fears - Self	Desire Pregn.	Depend-ency	Fears - Baby	Irrit. & Tension	Maternal Feeling	Depress. & Withdr.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49
50	51	52	53	54	55	56
57		58	59	60	61	62
63		64	65	66	67	68
Maximum Total Score 39	27	40	40	40	47	40

scores on a particular scale, the less "desirable" her condition is considered to be for that scale. Because scale score means and standard deviations varied considerably, all scores for the PRQ were converted to T-scores for the purpose of cross-comparisons, should they be necessary. Consequently, all analyses of these Health Problems and Psychological Reactions involved T-score values unless stated otherwise. It should be noted that although scores were obtained for all of the scales, as has already been mentioned, the scores for "Health Problems before this Pregnancy" and "Problems of Menstruation" were not analyzed or discussed in the present study.

Definitions of Dependent and Predictor Variables

Variables obtained from the Background Information Questionnaire:

Months.- the number of months that the subject had been pregnant at the time of completing the questionnaire.

Antenatal Course Attendance.- Subjects were divided into three groups, viz., a) those who were attending an antenatal course at the time they completed the questionnaire; b) those who were not attending at the time they answered the questionnaire but had attended such a course at some time in the past; and

c) those who were not attending an antenatal course and had never attended one in the past.

Gravida Status.- i.e., Primigravidae - subjects who were pregnant for the first time; Duigravidae - subjects pregnant for the second time; and Multigravidae - subjects pregnant for the third time or more.

Woman's Age.- the subject's age expressed in years.

Husband's Age.- expressed in years.

Age Wed.- the subject's age in years when she married.

Education.- refers to the level of education achieved by the subject. The scale was a seven point one - 1 representing Form 1 and 7 representing Form 7.

Tertiary Education.- refers to the extent to which subjects experienced tertiary education including - university studies, Technical Institute trade and business courses, and professional courses such as nursing studies.

Husband's SES.- was based on Elley and Irving's (1976) scale of occupations for men. The scale is a 6-point one, 1 being the value assigned to occupations such as Accountant and Doctor, and 6 being the value assigned to occupations such as Cleaner, Kitchen-

hand etc.

Woman's SES.- was based on Irving and Elley's (1977) socio-economic index for women - a scale with characteristics which are essentially equivalent to those of the 1976 scale.

Number of Male Children.- refers to the number of male children already in the subject's family.

Number of Female Children.- refers to the number of female children already in the subject's family.

Total number of Children.- refers to the total number of children already in the subject's family.

Oldest Child.- i.e., age of the subject's oldest child in years.

Youngest Child.- i.e., age of the subject's youngest child in years.

Number of Miscarriages.- refers to the mean number of miscarriages already experienced by the subjects.

Mean Week of Miscarriage.- refers to the mean week of pregnancy at which the miscarriages already experienced occurred.

Family in Locality.- derived from the assessment of whether there were members of the subject's

family living in Christchurch. The scale was a simple two-point one - 1 = yes, there were family members living in Christchurch; and 0 = no, there were no family members living in Christchurch.

Parents Living.- the categories for this question are shown in Table 4 (included in the Results chapter). For the analyses, the categories were coded as follows: 0 = both dead, 1 = father only alive, 2 = mother only alive, 3 = both alive.

Comfort Scale.- included three levels: Comfort level 1 (financially insecure i.e., families apparently suffering considerable financial hardship); Comfort level 2 (financially secure) and Comfort level 3 (financially very secure i.e., families who appear to be wealthy or at least "very well off").

Variables derived from the Pregnancy Research Questionnaire:*

Anxiety during Pregnancy.- This score was derived from the answers to such questions as - "Do you have trouble getting to sleep or

* As discussed previously, all PRQ dependent variables were derived as specified in Tables 1 and 2 and were expressed in T-score units.

staying asleep? Do you have pressure or pains in the head? Have you ever been bothered by your heart beating hard? Are you ever bothered by dreams that frighten you or upset you very much? Do you bite your fingernails?" etc.

(Raw Score Range: 35 (minimum) - 140 (maximum)).

Sleep Disturbance during Pregnancy.- derived from answers to the following questions: "Do you have trouble getting to sleep or staying asleep? Are you ever bothered by dreams that frighten you or upset you very much? Do you ever feel that you are going to have a nervous breakdown?" (Raw Score Range: 3 (minimum) - 12 (maximum)).

Nausea.- was derived from the answers to the following questions: "How often are you bothered by having an upset stomach? Are you troubled by nausea or morning sickness? Are you troubled with vomiting?"

(Raw Score Range: 3 - 12)

Fears for Self.- derived from the responses to such statements as: "If only she would admit it, every pregnant woman is scared and worried. I worry that I'll have a hard time during delivery. I believe that most women make too much fuss about the

difficulties of childbirth" etc.

(Raw Score Range: 10 - 39)

Desire for Pregnancy.- derived from the reponse to such statements as: "Before pregnancy, I had been looking forward to having a baby. I did not want to have a baby at this time. Before I became pregnant, we were hoping to have a baby" etc.

(Raw Score Range: 7 - 27)

Dependency.- derived from the response to such statements as: " A pregnant woman needs lots of consideration from her family. No matter how much a young mother knows, she still should have her mother or some older woman around" etc.

(Raw Score Range: 10 - 40)

Fears for Baby.- derived from the response to such statements as: "I worry that I may lose my baby. Any pregnant woman is concerned whether her baby will be normal. The baby can be harmed if the mother gets upset during pregnancy" etc.

(Raw Score Range: 10 - 40)

Irritability and Tension.- derived from the reponse to such statements as: "I'm easily upset since pregnancy. I have felt that my pregnancy is long and tiresome. I've been less patient with family and friends during

pregnancy" etc.

(Raw Score Range: 10 - 40)

Maternal Feeling.- derived from the response to such statements as: "I would like it best if my baby were with me in the hospital all the time. When you first began to menstruate, how did you feel about it?" etc.

(Raw Score Range: 10 - 47)

Depression and Withdrawal.- derived from the response to such statements as: "I've lost interest in things during pregnancy. Since becoming pregnant, I've become discouraged. I have been happy and cheerful during pregnancy. Since becoming pregnant, I've been unhappy and in low spirits" etc.

(Raw Score Range: 10 - 40)

Statistical Analyses

Predicting Maternal Anxiety. Two parallel series of multiple regression analyses (Kerlinger and Pedhazur, 1973) for six dependent variable measures (Anxiety during Pregnancy, Sleep Disturbance during Pregnancy, Fears for Self, Fears for Baby, Irritability and Tension, and Depression and Withdrawal) were undertaken using a set of variables considered as possible predictors of the six anxiety-related measures. The first series of analyses was undertaken to assess the predictive value of Comfort Scale and the following predictor variables: Month of

Pregnancy reached, Antenatal Course Attendance, Gravida Status, Education, Tertiary Education, Oldest Child, Youngest Child, Number of Miscarriages, Mean Week of Miscarriage, Family in Locality, and Parents Living. A second series of analyses was undertaken with Comfort Scale excluded as a predictor but its constituent variables included instead. The predictor variables for the second series of analyses thus included: Month of Pregnancy, Antenatal Course Attendance, Gravida Status, Woman's Age, Husband's Age, Age Wed, Education, Tertiary Education, Husband's SES, Woman's SES, Number of Female Children, Number of Male Children, Total Number of Children, Oldest Child, Youngest Child, Number of Miscarriages, Mean Week of Miscarriage, Family in Locality, and Parents Living.

Characteristics Distinguishing Highly Anxious and Medium/Low Anxious Women. Many researchers now believe that most, if not all, women experience some degree of anxiety during pregnancy. The group of women of particular interest in the present study however, is that consisting of women who appear to be more anxious than usual. In this connection, three distinct groups were selected. The intention was to select the twenty most anxious women, the twenty least anxious women, and twenty women whose scores were close to the median for the total sample. (Single women were excluded from these three contrast groups because of the small numbers involved.)

Consequently, the groups actually obtained were as follows: Highly anxious - median (raw) score = 95.5, range = 90 - 106 (N = 20); Medium anxiety - median score = 73, range = 71 - 74 (N = 20); Low anxiety - median score = 50, range = 38 - 52 (N = 20). It can be seen from these groupings that there were distinct gaps between groups in the scores obtained. It was felt that such groupings would eliminate borderline cases that may otherwise have masked the comparisons.

The analyses undertaken on these groups were one-way multivariate analyses of variance (MANOVA). The computer programme used for these analyses was a revision of Bock's (1963) MANOVA programme developed at the University of North Carolina by Eliot Cramer, and held on disc at the University of Canterbury Computer Centre. Interpretation of main or interaction MANOVA effects followed the procedures recommended by Bock (1975), Hummel and Sligo (1971), Jones (1966), and Wilkinson (1975). The Newman-Keuls procedure (Winer, 1971) was used to undertake specific comparisons of means.

Exploratory Analyses. A set of MANOVA analyses was undertaken using Comfort Scale, Gravida Status and Trimester as blocking factors for each set of dependent variables. The first set of these MANOVA analyses used Comfort Scale and Gravida Status as blocking factors and the dependent variables were: - Anxiety during Pregnancy, Sleep Disturbance, Nausea, Fears for Self, Fears for Baby, Desire for

Pregnancy, Dependency, Irritability and Tension, Maternal Feeling, and Depression and Withdrawal. The first analysis was thus a two-way MANOVA involving three Comfort levels and three Gravida status groups. The second MANOVA analysis in this series used Comfort Scale and Trimester as blocking factors for the set of dependent variables listed above. The second analysis was thus a two-way MANOVA involving three Comfort levels and three pregnancy Trimester groups. The third MANOVA analysis contrasted three Gravida groups with three Trimester groups against the set of psychological reactions listed above.

A fourth MANOVA was concerned with Marital Status. Included in the total sample were twenty single women, of whom sixteen stated that they intended to keep their babies. Even though there appears to be less discrimination against unmarried mothers than a few years ago, these women almost certainly face a very difficult situation by attempting to raise a child alone. Consequently, it seemed necessary to investigate the "state" of this group of women in comparison with the rest of the sample. Unfortunately, the single group is small in number compared with the married group, but it was still considered worth making the comparison. The analysis undertaken was a two-way multivariate analysis of variance (MANOVA) using two Marital Status groups and three Trimester groups and the dependent variables listed previously. An analysis contrasting Marital Status and Gravida Status with the dependent variables was not undertaken because all except

two of the single women were Primigravidae.

The final set of analyses was concerned with Antenatal classes. During the period in which the study was undertaken, there were at least nine different antenatal courses available to pregnant women. Although the type of information available to women seemed to be similar across the courses, the atmosphere in which they were conducted appeared to vary considerably from very large hospital classes to small personal classes run by independent organizations. It was therefore considered a possibility that there could be differences in women's psychological adjustment depending on which course was attended. Consequently, an analysis of variance (ANOVAN) was undertaken to ascertain whether anxiety levels of women differed according to the particular course they had attended.

CHAPTER FOUR

RESULTS

Descriptive Statistics for Predictor Variables

Table 3 represents the means and standard deviations and/or percentages of occurrence for each of the predictor variables derived from information provided by the Background Information Questionnaire (BIQ). For some measures, means and standard deviations are not meaningful and percentages are used to indicate observed frequencies in those particular categories. Where appropriate, predictors are listed in subgroups to give an indication of the various subsamples.

Descriptive Statistics for Measures of Maternal Anxiety

The means and standard deviations (raw scores) of the anxiety-related variables that were to be predicted from the BIQ data are presented in Table 4.

Predicting Maternal Anxiety

A set of step-wise multiple regression analyses were undertaken for Anxiety during Pregnancy and the twelve predictor variables. Table 5 summarizes the results from this analysis. It can be seen from this table that

Table 3

Means and Standard Deviations and/or Percentages of Occurrence for Variables used to predict Psychological States

Variable	N	Mean	SD	Percentage
Months(month of pregnancy)	258	6.31	1.81	
Antenatal Class Attendance		1.95	0.81	
1. Were attending classes	92			35.66
2. Were not attending but had in the past.	87			33.72
3. Were not attending and never had.	79			30.62
Gravida Status		1.88	0.76	
1. Primigravidae	91			35.27
2. Duigravidae	107			41.47
3. Multigravidae	60			23.26
Woman's Age(in years)	258	25.10	5.18	
Husband's Age(in years)	238	25.88	8.34	
Age Wed(in years)	238	19.58	7.01	
Education(level attained)	222	5.18	0.93	
Tertiary Education	78			30.23
Husband's SES	238	3.09	1.62	
Woman's SES	258	1.86	2.08	
No. of Male Children	258	0.48	0.64	
No. of Female Children	258	0.38	0.61	
Total No. of Children	258	0.86	0.87	
Oldest Child(in years)	258	2.21	2.77	
Youngest Child(in years)	258	0.60	1.53	
No. of Miscarriages	35			13.56
Mean Week of Miscarriages	35	11.11	6.82	
Family in Locality	184			71.32
Parents Living				
neither alive	3			1.16
mother alive	41			15.89
father alive	10			3.88
both alive	198			76.74
not specified	6			2.33
Comfort Level		2.11	1.05	
1. Financially insecure	44			17.05
2. Financially secure	165			63.95
3. Financially very secure	45			17.44

Table 4

Means and Standard Deviations (Raw Scores) of Anxiety-Related Measures to be Predicted from Background Information

Psychological Variable	N	Mean	SD
Anxiety during Pregnancy	258	69.03	13.64
Sleep Disturbance during Pregnancy	258	5.52	2.03
Fears for Self	258	19.99	4.62
Fears for Baby	258	21.76	4.69
Irritability and Tension	258	22.77	6.79
Depression and Withdrawal	258	19.25	6.11

Table 5

Summary of Multiple Regression Analysis of Predictor Variables for Anxiety during Pregnancy scores

Variable	Multiple R	R^2	R^2 Change
Comfort Level	0.22	0.05	0.05
Tertiary Education	0.28	0.08	0.03
Education	0.30	0.09	0.01
Oldest Child	0.32	0.10	0.01
Youngest Child	0.33	0.11	0.008
Family in Locality	0.34	0.12	0.004
Months	0.35	0.12	0.003
Parents Living	0.35	0.12	0.002
Number of Miscarriages	0.35	0.12	0.003
Antenatal Class Attendance	0.36	0.13	0.002
Gravida Status	0.36	0.13	
Mean Week of Miscarriage	0.36	0.13	

the best single predictor of Anxiety during Pregnancy was Comfort level. The relationship between Comfort and Anxiety was negative, i.e., the less comfortable the woman felt her financial situation to be, the more anxious she appeared to be. Tertiary Education appeared to be the second best predictor followed by Education, Oldest Child, Youngest Child, and Family in Locality. Antenatal Class Attendance which is of special interest to the present study, appears in tenth place in the predictive order for this analysis which means that although attendance at Antenatal classes does make a significant contribution to the prediction of Anxiety during Pregnancy, it is by no means one of the best predictors. It is noticeable that the Multiple R for the first six variables in Table 5 is only 0.34, thus accounting for a very small proportion of the variance for pregnancy anxiety scores. It thus seems probable that as yet unidentified variables are also implicated in the anxiety levels of pregnant women.

Other Anxiety-Related Variables. Similar analyses were undertaken on the five other measures related to maternal anxiety (Sleep Disturbance during Pregnancy, Fears for Self, Fears for Baby, Irritability and Tension, Depression and Withdrawal). It can be seen from the results (summarized in Tables 23-27, Appendix C) that Comfort score is either the best or second best predictor in three of these additional analyses and that Tertiary Education is the

best predictor in two of the analyses. It will be noted however, that in these five additional analyses, Antenatal Class Attendance is not a strong predictor. In fact, the highest position it holds (as a predictor) in any of these analyses is ninth position. An interesting result is obtained in Tables 24 and 25. In the analyses for Fears for Baby, Family in Locality is the best predictor and the third best predictor of Fears for Self. The relationship, which in both cases was a positive one, suggests that those women who had family members in Christchurch whom they saw from time to time, had greater fears for themselves and the baby than women who did not have family members in Christchurch. It is also interesting to note that Month of Pregnancy is the single best predictor of Irritability and Tension (Table 26) and the second best predictor of Depression and Withdrawal (Table 27). It is also noticeable that Miscarriage features in the first six predictors of all five of these additional analyses.

Comfort scores were derived by combining several measures including the predictor variables discussed in the Methods chapter. It is possible that the combination of variables could well have distorted the relationship between the various predictor variables and the criterion variable. It is also true that certain of the variables used to indicate financial hardship are also indicators of other states,e.g., Age of Woman, and Age of Husband although predictors of possible income, are also predictors of maturity which could very well affect attitudes

toward pregnancy and childbirth (i.e., adjustment to the whole process). Total number of children, although being a contributing factor to financial hardship, is also a contributing factor to birth difficulties related to gravidity, and therefore a possible contributing factor to fears and tensions. Consequently, it seemed necessary to repeat the regression analyses excluding Comfort scores and substituting the constituent variables of the Comfort scores. Summaries of the results for these additional analyses may be seen in Tables 28-33 (Appendix C).

For the predictors of Anxiety (Table 28 compared with Table 5), the order of the first six variables in the second analysis is similar to that in the original analysis. It can be seen that in Table 28, Tertiary Education is in first position (compared with second position in Table 5), then follow Husband's SES and Husband's Age which are both constituents of Comfort, then Oldest Child and Education which are in reverse order to Table 5, followed by Youngest Child which holds this position in both tables. The analyses for Sleep Disturbance produce similar results in both cases (Table 23 compared with Table 29). The first two variables in Table 29 are in the same predictive order as in Table 23 followed by Husband's Age. The variables down to Oldest Child in Table 29 are in similar positions to those in the original analyses with only minor changes of position. The analyses for Fears for Self indicate that Tertiary Education is still the best single predictor but

Gravida Status which was the second best predictor in Table 24 drops to thirteenth position in Table 30. The analyses for Fears for Baby (Tables 25 and 31) are very similar in that the variables have similar predictive positions except for minor reversals of order. The analyses for Irritability and Tension (Tables 26 and 32) show an interesting change. It can be seen that Age Wed, a constituent of Comfort, and a variable which does not appear as a prominent predictor in any of the other analyses, appears as the single best predictor of Irritability and Tension. The relationship produced was a negative one which means that the younger subjects were when they married, the more irritable and tense they tended to be during the current pregnancy. There is also quite a change in the positions of the remaining variables in this table. The analyses for Depression and Withdrawal (Tables 27 and 33) also demonstrate considerable changes in position of the particular variables. In all of these six additional analyses, the position of Antenatal Class Attendance is still not strong although it does reach seventh position in Table 28 - the analysis for the prediction of Anxiety during Pregnancy.

It should be noted that for all of these analyses, the correlations obtained for the best predictors or sets of predictors were not high. Indeed, the highest correlation obtained for any single predictor was 0.22 which accounts for only slightly more than 4 percent of the total variance. In Table 5 it can be seen that the

predictive value of Comfort was 0.22 and that the multiple R obtained for the whole set of variables in this table was only 0.36. While the variables listed in the table all make a statistically significant contribution to the prediction of Anxiety during Pregnancy, there is still a lot of variance which is not accounted for. One reason for this could be that there are other more predictive factors not considered in these analyses. Another is the possibility of unreliability in the measures of either the predictor or criterion variables, or of both.

Characteristics distinguishing Highly Anxious and Medium/Low Anxious Women

Three anxiety contrast groups were selected as explained in the Method chapter. A one-way multivariate analysis of variance (MANOVA) was carried out on the descriptive data to determine whether the highly anxious group of subjects differed significantly from the medium and low anxious subjects on any of the variables. There were significant differences between the highly anxious subjects and the other two groups but no significant differences between medium anxious and low anxious groups. Consequently, these latter two groups were combined and contrasted with the highly anxious women in the subsequent multivariate analyses of variance.

A significant multivariate groups main effect was obtained ($F(9,50) = 2.61$, $p<0.015$), and a summary of this analysis is presented in Table 6. It can be seen that

Table 6

Summary of Multivariate Analysis of Variance (Main Effects) of scores for High vs Medium/Low Anxious Married Subjects* on BIQ Variables

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 1	2.61	9.00	50.00	0.015	0.56

UNIVARIATE F TESTS

Variable	F(1,58)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Months	0.01	0.03	0.924	-0.02
Antenatal Class Attendance	0.57	0.41	0.452	-0.12
Gravida Status	0.23	0.13	0.629	0.15
Education	0.02	0.07	0.889	-0.25
Tertiary Education	11.86	2.41	0.001	-0.73
No. of Miscarriages	0.00	0.00	1.000	-0.01
Family in Locality	3.98	0.83	0.051	0.22
Parents Living	0.39	0.13	0.532	0.32
Comfort Level	10.31	3.01	0.002	-0.63

*As there were only five unmarried subjects in these anxiety groups, they were excluded from this analysis.

Tertiary Education, Family in Locality and Comfort score all show a significant difference between the two groups. The percentages of women in these contrast groups who had had Tertiary Education were 10.00, 60.00 and 45.00 for the high, medium and low anxiety groups respectively. Of the twenty women in the highly anxious group, only two had experienced tertiary education. This seems in striking contrast to the proportions in the other two groups. Of the medium anxious group, twelve had attended a tertiary institution as had nine of the low anxious group. Thus, 52.50 percent of the combined medium/low anxious group had experienced tertiary education, whereas only ten percent of the highly anxious women had done so. The results for Family in Locality showed that of the highly anxious women, almost the entire group (85%) had members of their families living in Christchurch while only 60 percent of the medium/low anxiety group were in this position.

The results for Comfort scores may be difficult to interpret from the means and standard deviations (Table 7). Accordingly, it seems useful to examine the percentages in each anxiety contrast group at each level of the Comfort scale. The percentages for the highly anxious group were as follows: Comfort level 1 (financially insecure) = 40 percent; Comfort level 2 (financially secure) = 55 percent; and Comfort level 3 (financially very secure) = 5 percent. In contrast with this distribution, the percentages for the medium/low anxiety group were 7.50, 72.50 and 20.00 respectively. It can thus be seen that the

Table 7

Means and Standard Deviations (SD's) of BIQ Variables for High vs Medium/Low Anxious Married Subjects*

Variable	Anxiety Level			
	High (N = 20)		Med/Low (N = 40)	
	Mean	SD	Mean	SD
Months	6.20	1.85	6.25	1.93
Antenatal Class Attendance	2.05	0.83	1.87	0.85
Gravida Status	2.05	0.83	1.95	0.71
Education	4.50	1.23	4.57	2.23
Tertiary Education	0.10	0.31	0.52	0.51
No. of Miscarriages	0.10	0.31	0.10	0.30
Family in Locality	0.85	0.37	0.60	0.50
Parents Living	2.80	0.52	2.70	0.61
Comfort Level	1.65	0.59	2.12	0.52

* As there were only five unmarried subjects in the above anxiety groups, they were excluded from this analysis. Their scores on anxiety were:
  High anxiety - 95, 94 and 93; and
  Med/Low anxiety - 71 and 45.

percentage of women in the highly anxious group who lacked economic security was substantially higher than was the case for the medium/low anxious group.

A multivariate analysis of variance was also computed with Comfort scores eliminated and the constituent variables included. The results for this analysis were not significant. (Tables 34 & 35, Appendix C).

The question arose that perhaps some women had married originally because they had become pregnant. It seems probable that in the past there has been a much greater stigma attached to unmarried women having children than there is now. Accordingly, the results from the questionnaires were analyzed to determine whether in fact, a greater proportion of women in the highly anxious group had apparently been pregnant when they married. Of the 20 women in the highly anxious group, 4 were pregnant when they married, 9 were possibly pregnant at marriage, and 2 already had a child when they married (Table 8). The numbers in these categories for the 40 women in the medium/low anxious group were 4, 11 and 0 respectively. When these figures are summed for each group, it can be seen that at marriage a much higher proportion (15/20 = 75%) of the highly anxious group were pregnant, possibly pregnant or had already had a child than was the case for the medium/low anxious group (15/40 = 37.50%). It thus seems possible that pregnancy had precipitated a marriage for a number of the women who otherwise might not have taken that step, at least, not at that time - and a

Table 8

Comparison of Results for Highly Anxious Women vs Med/Low Anxious Women who may possibly have been "Forced" to Marry by becoming Pregnant

Variable	Anxiety Level	N	Percentage
Pregnant when married	H	4	25.00
	ML	4	12.50
Possibly pregnant when married	H	9	45.00
	ML	11	27.50
Had a child before marriage	H	2	10.00
	ML	0	0.00
Total of the above three categories	H	15	75.00
	ML	15	37.50

noticeably higher proportion of such women are apparently in the highly anxious group.

In brief, the MANOVA analyses contrasting highly anxious women with medium/low anxious women indicates some very clear differences between the two groups. Firstly, as revealed by the previous predictive analyses, Comfort Scale is of importance for it seems that those women who are financially insecure, are likely to show a high degree of anxiety during pregnancy. Secondly, women who have experienced tertiary education are less likely to be highly anxious during pregnancy than women who have not experienced tertiary education. It is not possible to determine whether tertiary education is related to level of intelligence for the subjects in this study, but it does raise the possibility of more extensive knowledge due to an extended education. It is possible that women who have experienced tertiary education may have more knowledge of pregnancy and the birth experience through their own reading - regardless of whether or not they have attended antenatal classes (if this was the case, it would tend to reduce the effect of such classes). Thirdly, women in the highly anxious group are more likely to have family members living in Christchurch. This differential could reflect a number of possibilities. For example, it is possible that highly anxious women are more reliant on their family members for information and advice about childbirth and pregnancy, and this type of advice may not necessarily be as factual as that obtained from books or antenatal courses.

It is possible that information gained from family members may be "coloured" according to the experiences they themselves have had. Alternatively, it is possible that women who have experienced tertiary education have had to leave their home towns to receive that education and have as a result, become more independent and self-reliant than women who have remained in their home towns.

Exploratory Analyses

Despite the relatively low predictive efficiency of the various descriptive characteristics which were examined in relation to anxiety measures, several were of considerable interest in their own right, viz., Comfort score (the extent to which a woman was free from financial hardship - high, medium, or low); Gravida Status (primi-, dui- or multigravida); and Trimester of Pregnancy (1st, 2nd or 3rd). Subjects were grouped on each of these variables and each variable was subsequently incorporated as a "blocking factor" in a series of two-way (Comfort score by Gravida Status, and Comfort score by Trimester*) multivariate analyses of variance. The set of dependent variables analyzed in each MANOVA included the anxiety-related measures (previously subjected to regression analyses) plus several other measures of maternal characteristics which were derived from the Pregnancy

*Analyses of Gravida Status by Trimester were also undertaken (Tables 36-39, Appendix D). It can be seen that the interaction effect obtained was nonsignificant and the analyses for the main effects made no additional contribution to the results obtained from the other two sets of analyses.

Research Questionnaire (Desire for Pregnancy, Dependency, Maternal Feelings, and Nausea).

Comfort Score and Gravida Status

After the subjects had received the questionnaires, it was apparent that the economic situation of the country was becoming increasingly uncertain and it seemed likely that families suffering from unemployment or financial hardship would be affected adversely by the birth of a child much more than families who were financially secure. It was realized that the degree of hardship a family would experience would depend not only on the actual level of income, but also on other factors (number of children already in the family, length of time since marriage, presence or absence of housing problems, etc.), and the Comfort scale was devised to assess the degree of hardship, or otherwise, experienced by the subjects.

Women who were suffering financial hardship could perhaps be expected to be anxious about their pregnancies. At the same time, it seemed likely that such women would desire the pregnancy (and perhaps a child) less than would women who were financially secure. It also seemed probable that they would be more depressed than women not suffering from financial hardship. These possibilities were examined in the first set of exploratory analyses.

Gravida Status is a variable which has been used consistently in other studies of pregnancy and has been

used as a blocking factor in this study because it seems logical that women experiencing their first pregnancy would react differently from women who are experiencing a second or later pregnancy. It also seemed logical to differentiate between women experiencing their second pregnancy from those in their third or later pregnancy because it is conceivable that a second pregnancy could be highly desirable to couples wishing to complete their families, or wishing for a child of the opposite sex to that of their first child. It is also conceivable that if a woman miscarried her first pregnancy, the second pregnancy would be very desirable. One further consideration was that in the present economic recession, smaller families might be more desirable than families with several children, in which case multigravidae may be more upset by the current pregnancy than duigravidae or primigravidae. On the other hand, it is possible that because multigravidae are more experienced than either of the other two groups with regard to pregnancy, they may be less anxious than the women in the other two gravida groups.

The MANOVA for Comfort score by Gravida Status yielded a significant interaction effect and significant main effects for both Comfort score and Gravida Status (Tables 9-12). Significant univariate interaction effects were obtained on Desire for Pregnancy and Dependency (Table 9), and simple effects analyses were undertaken on

Table 9

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety Data: Comfort Scale x Gravida Status Interaction Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 4	1.44	40.00	896.74	0.041	0.32
2 through 4	1.16	27.00	694.88	0.261	0.26
3 through 4	0.89	16.00	474.00	0.580	0.20
4 through 4	0.66	7.00	237.50	0.703	0.14

UNIVARIATE F TESTS

Variable	F(4,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	0.52	47.06	0.721	0.11
Sleep Disturbance	0.84	77.37	0.500	0.08
Nausea	1.30	126.03	0.271	-0.60
Fears for Self	1.84	178.03	0.122	-0.07
Desire for Pregnancy	2.84	163.19	0.025	0.26
Dependency	4.58	426.96	0.001	0.77
Fears for Baby	1.65	163.70	0.162	0.23
Irritability and Tension	0.72	63.99	0.575	0.18
Maternal Feeling	0.75	71.68	0.559	0.08
Depression and Withdrawal	0.65	55.59	0.625	-0.24

Table 10

Summary of Means and Standard Deviations for Comfort Level and Gravida Status

GROUPS				VARIABLE									
Gravida Status	Comfort Level	N	M SD	Anxiety dur.Prg	Sleep Dist.	Nausea	Fears Self	Desire Preg.	Depend -ency	Fears Baby	Irrit. & Ten.	Matern. Feeling	Depress. &Withdr.
Primi-	1	25	M	55.90	54.35	51.99	53.92	64.96	54.36	55.79	56.88	51.88	58.88
			SD	10.00	11.44	10.31	9.76	10.53	10.97	12.77	10.46	12.31	10.00
	2	49	M	47.60	46.36	49.38	48.39	47.80	45.94	49.85	45.59	47.64	47.35
			SD	8.64	8.35	9.74	8.46	6.91	10.86	8.41	7.44	9.41	8.11
	3	13	M	44.00	45.58	46.91	50.52	45.18	52.25	50.01	44.56	49.42	46.07
			SD	8.63	7.65	8.91	11.14	3.77	9.07	9.05	11.73	10.09	10.12
Dui-	1	11	M	57.18	58.63	53.90	55.14	53.38	53.23	50.89	55.57	49.73	55.83
			SD	9.61	12.45	9.75	13.80	7.75	7.99	12.05	10.51	8.69	10.23
	2	73	M	49.54	50.43	48.90	51.06	45.85	51.52	49.71	50.12	50.29	49.70
			SD	8.87	9.40	9.73	10.13	5.80	8.45	9.18	9.29	9.78	9.70
	3	23	M	44.94	46.18	50.37	46.07	43.96	46.95	48.83	46.50	46.93	44.97
			SD	9.29	6.49	10.66	8.86	2.25	10.74	9.45	8.68	7.07	7.05
Multi-	1	8	M	58.04	56.07	60.34	47.59	64.80	44.04	44.37	58.08	55.17	59.40
			SD	10.90	9.74	9.41	10.31	13.94	7.46	7.60	10.85	9.42	9.57
	2	43	M	51.28	50.67	50.97	48.41	50.28	50.88	48.72	51.51	50.76	49.44
			SD	11.45	11.34	10.51	9.84	9.48	9.22	10.35	10.21	10.11	9.07
	3	9	M	52.18	52.93	45.97	51.23	50.84	46.86	51.45	49.03	50.74	47.23
			SD	7.48	7.55	4.67	9.19	9.36	11.36	14.23	7.95	9.14	11.36

Table 11

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety Data: Comfort Level Main Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	6.79	20.00	472.00	0.001	0.62
2 through 2	0.41	9.00	236.50	0.928	0.12

UNIVARIATE F TESTS

Variable	F(2,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	15.69	1418.51	0.001	0.17
Sleep Disturbance	12.20	1122.85	0.001	0.06
Nausea	4.63	449.05	0.011	0.04
Fears for Self	2.97	287.53	0.053	-0.21
Desire for Pregnancy	62.03	3569.36	0.001	0.90
Dependency	2.26	210.66	0.107	0.14
Fears for Baby	1.05	104.44	0.350	0.01
Irritability and Tension	17.70	1561.64	0.001	-0.08
Maternal Feeling	1.80	171.98	0.168	-0.18
Depression and Withdrawal	23.31	1982.12	0.001	0.32

Table 12

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety Data: Gravida Status Main Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	4.44	20.00	472.00	0.001	0.45
2 through 2	3.24	9.00	236.50	0.001	0.33

UNIVARIATE F TESTS

Variable	F(2,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1	2
Anxiety during Pregnancy	2.17	196.52	0.116	0.16	0.41
Sleep Disturbance	2.05	188.53	0.131	-0.54	0.42
Nausea	0.70	68.17	0.496	-0.01	0.06
Fears for Self	0.63	61.39	0.531	-0.27	-0.33
Desire for Pregnancy	20.08	1155.71	0.001	0.90	0.47
Dependency	0.64	59.27	0.530	-0.01	-0.05
Fears for Baby	1.83	181.67	0.162	0.36	-0.27
Irritability and Tension	2.24	197.48	0.109	-0.89	0.98
Maternal Feeling	1.01	96.20	0.367	-0.26	0.30
Depression and Withdrawal	0.48	40.46	0.622	0.91	-1.24

these variables. The simple effects analyses of Gravida Status (for each level of Comfort) by Desire for Pregnancy showed that significant results were obtained for Primigravidae ($F(4,245) = 33.13$, $p<0.001$), Duigravidae ($F(4,245) = 7.13$, $p<0.01$), and Multigravidae ($F(4,245) = 19.49$, $p<0.01$). Newman-Keuls tests on these results indicated that Primi-, Dui- and Multigravidae who were in Comfort level 1 (i.e., financially insecure) had a significantly lower desire for pregnancy than women in the other two Comfort levels.

Significant results were also obtained from simple effects analyses of Comfort score (for each level of Gravida Status) by Desire for Pregnancy (Comfort level 1 ($F(4,245) = 12.65$, $p<0.01$) and Comfort level 3 ($F(4,245) = 3.87$, $p<0.05$)). Newman-Keuls tests on these results indicated that within Comfort level 1 (financially insecure), Primigravidae ($\bar{X} = 64.96$) and Multigravidae ($\bar{X} = 64.80$) both had significantly less desire for pregnancy than Duigravidae ($\bar{X} = 53.38$), and within Comfort level 3, Multigravidae ($\bar{X} = 50.84$) have significantly less desire for pregnancy than Primigravidae ($\bar{X} = 45.18$) and Duigravidae ($\bar{X} = 43.96$). These results are presented in Figure 1.

The simple effects analyses (Comfort score for each level of Gravida Status) by Dependency revealed that significant results were obtained for Primigravidae ($F(4,245) = 6.79$, $p<0.01$) and Duigravidae ($F(4,245) = 3.72$, $p<0.05$). Newman-Keuls tests on these results

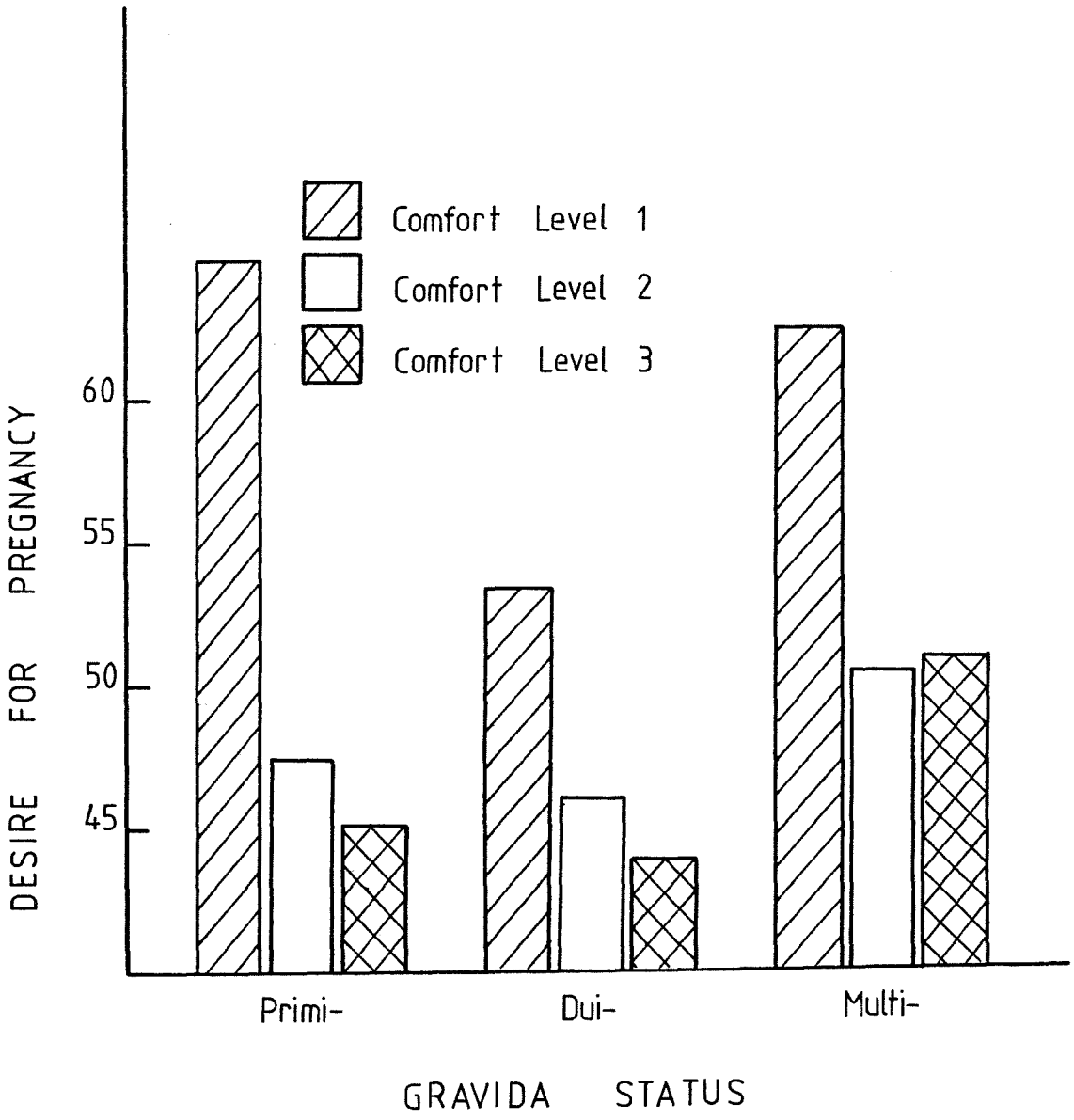

Fig.1. Desire for Pregnancy scores for Primi-, Dui- and Multigravidae in Comfort Levels 1, 2 and 3.

indicated that the only significant result was that Primigravidae in Comfort level 1 ($\bar{X}$ = 54.36) were significantly more dependent than women in Comfort level 2 ($\bar{X}$ = 45.94). The second set of simple effects analyses (Gravida Status for each level of Comfort) indicated that there were significant results within Comfort level 1 ($F(4,245) = 11.35$, $p<0.01$), Comfort level 2 ($F(4,245) = 3.30$, $p<0.05$), and Comfort level 3 ($F(4,245) = 3.37$, $p<0.05$). Newman-Keuls tests on these results indicated that within Comfort level 1, Primigravidae ($\bar{X}$ = 54.36) and Duigravidae ($\bar{X}$ = 53.23) were both significantly more dependent than Multigravidae ($\bar{X}$ = 44.04). These results are presented in Figure 2.

A significant multivariate main effect was obtained for Comfort ($F(20,472) = 6.79$, $p<0.001$), and significant univariate main effects were obtained for Anxiety, Sleep Disturbance, Nausea, Irritability and Tension, and Depression and Withdrawal (Table 11). There was also a significant univariate main effect for Desire for Pregnancy and these results were subjected to simple effects analyses (discussed previously under interaction effects).

Newman-Keuls tests on the means for Anxiety revealed that the women in Comfort level 1 ($\bar{X}$ = 56.61) were significantly more anxious than women in Comfort level 2 ($\bar{X}$ = 49.42) and Comfort level 3 ($\bar{X}$ = 46.12) but the difference between the latter two groups was not significant. These results are summarized in Figure 3.

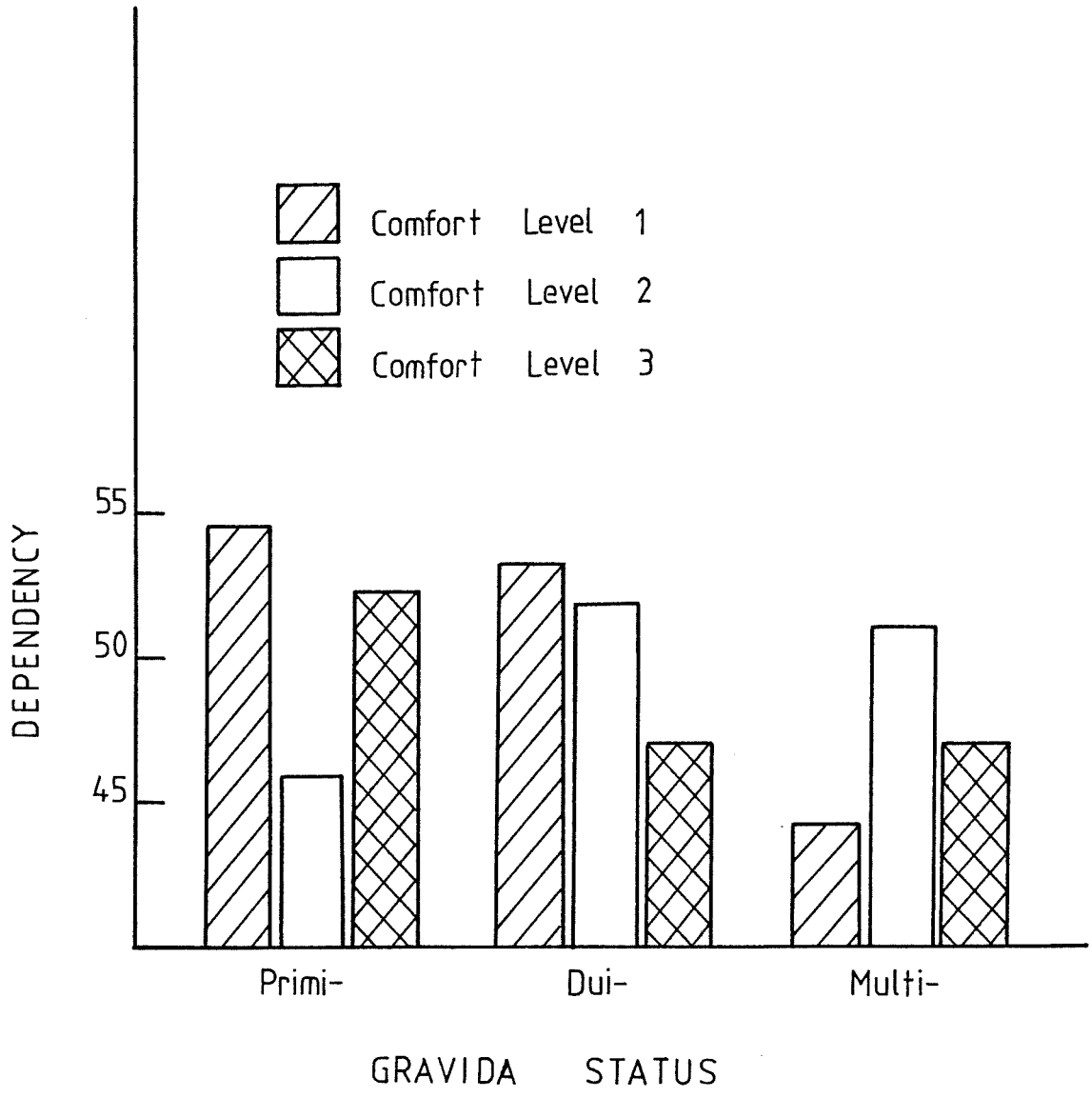

Fig.2. Dependency scores for Primi-, Dui- and Multigravidae in Comfort Levels 1, 2 and 3.

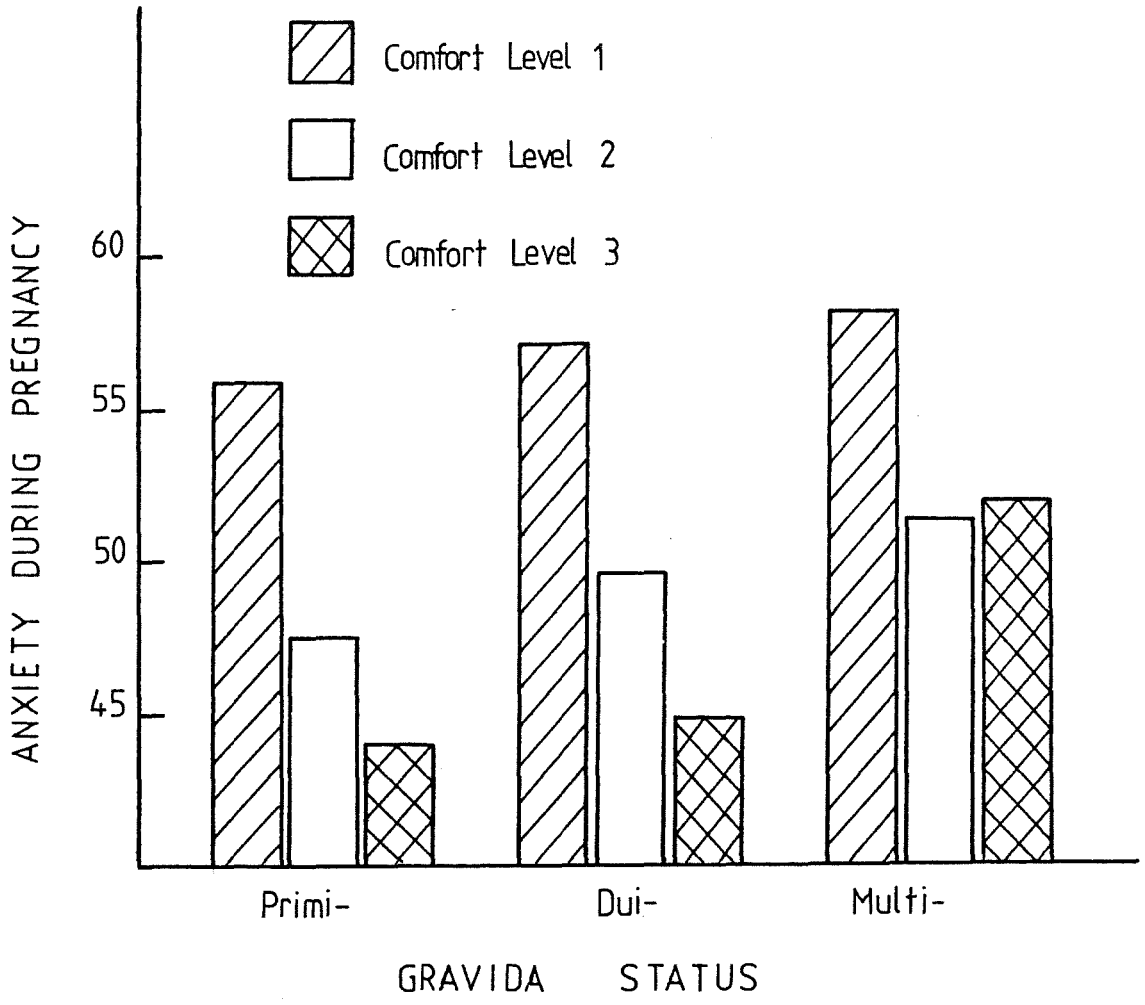

Fig.3. Anxiety during Pregnancy scores for women in Comfort Levels 1, 2 and 3 classified according to Gravida Status.

Newman-Keuls tests undertaken on the results for Sleep Disturbance indicated that women in Comfort level 1 ($\bar{X}$ = 55.73) suffered significantly more Sleep Disturbance than women in Comfort level 2 ($\bar{X}$ = 49.28) and Comfort level 3 ($\bar{X}$ = 47.65), but the difference between the latter two groups was not significant. These results are presented in Figure 4. For the remaining variables in this analysis, the pattern of results was identical. In each case, women in Comfort level 1 scored significantly higher than those in Comfort level 2 and Comfort level 3, with the difference between the latter two groups being non-significant. The results for Comfort level 1, 2 and 3 respectively, were as follows: Nausea - $\bar{X}1$ = 53.99, $\bar{X}2$ = 49.58, $\bar{X}3$ = 48.49; Irritability and Tension - $\bar{X}1$ = 56.77, $\bar{X}2$ = 49.14, $\bar{X}3$ = 46.45; Depression and Withdrawal - $\bar{X}1$ = 58.21, $\bar{X}2$ = 48.93, $\bar{X}3$ = 45.74. The results are presented in Figures 5-7.

A significant multivariate main effect was also obtained for Gravida Status ($F(20,472) = 4.44$, $p<0.001$) and a significant univariate main effect was obtained for Desire for Pregnancy. The results for this variable have already been discussed in the previous section concerning univariate interaction effects for Comfort score by Gravida Status. i.e., The univariate effect for Gravida Status indicated that for Primi-, Dui- and Multigravidae. women who were financially insecure had significantly less desire for the present pregnancy than women who were financially secure or very secure.

On the basis of the present set of analyses, it

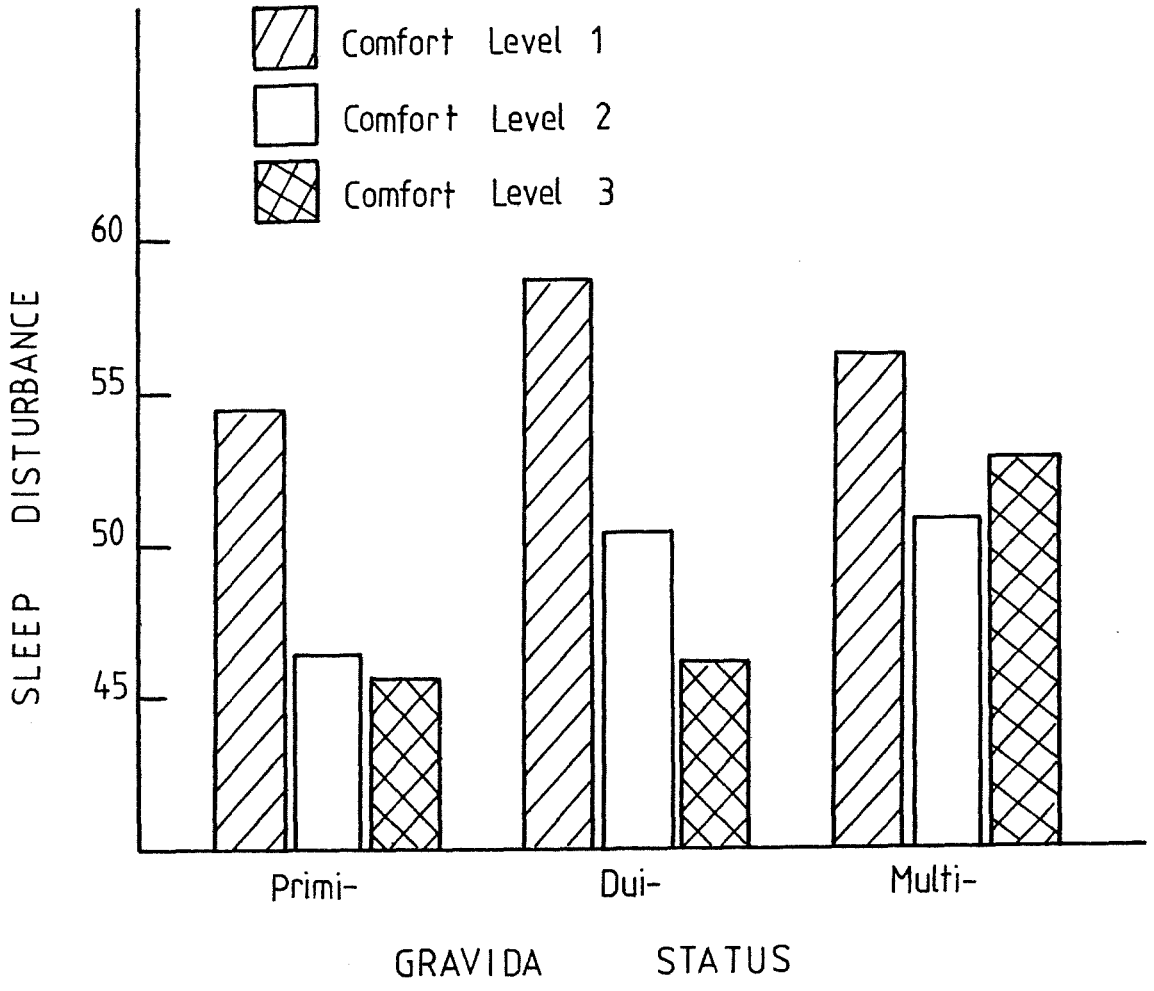

Fig.4. Sleep Disturbance during Pregnancy scores for women in Comfort Levels 1, 2 and 3 classified according to Gravida Status.

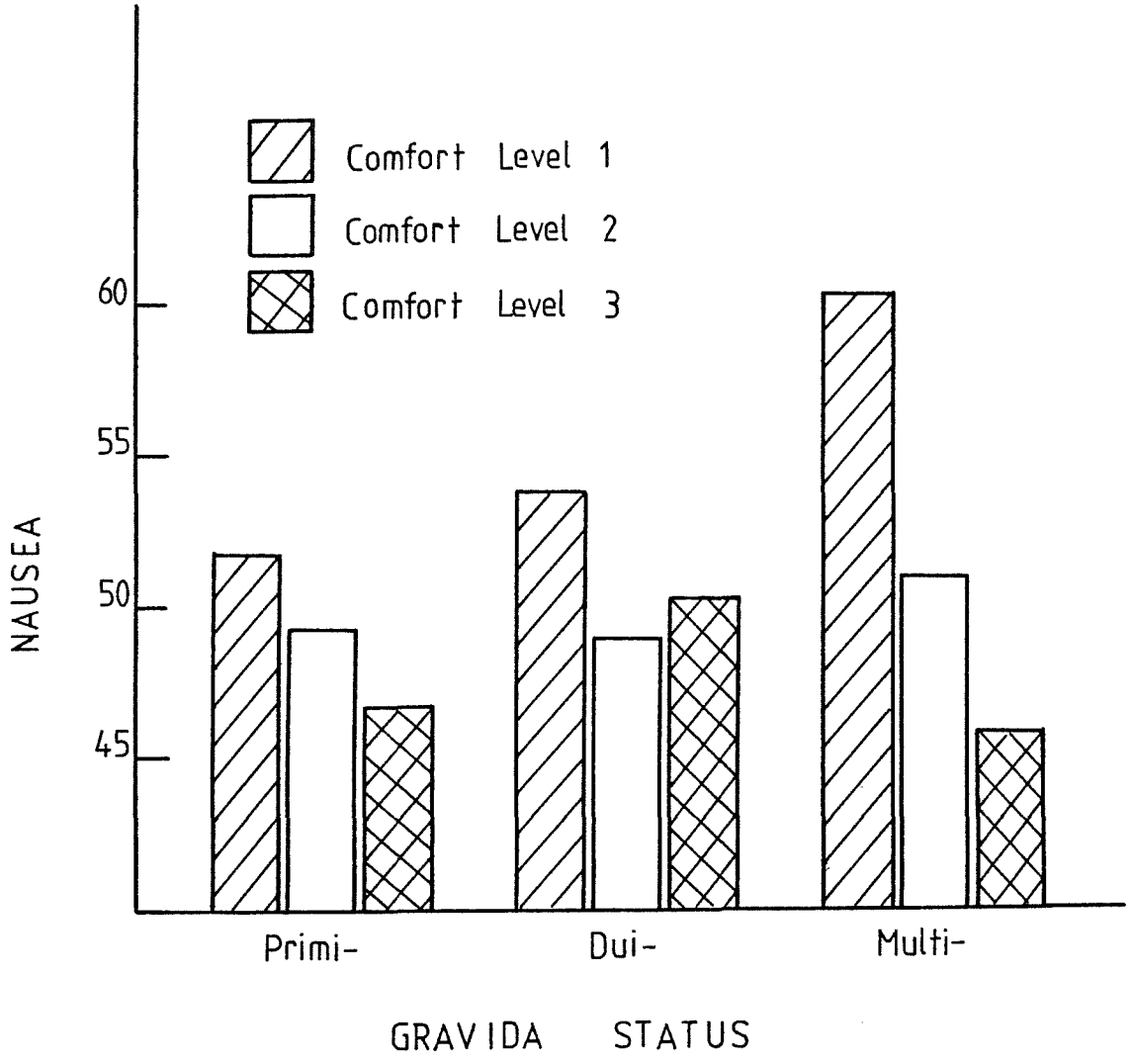

Fig. 5. Nausea scores for women in Comfort Levels 1, 2 and 3 classified according to Gravida Status.

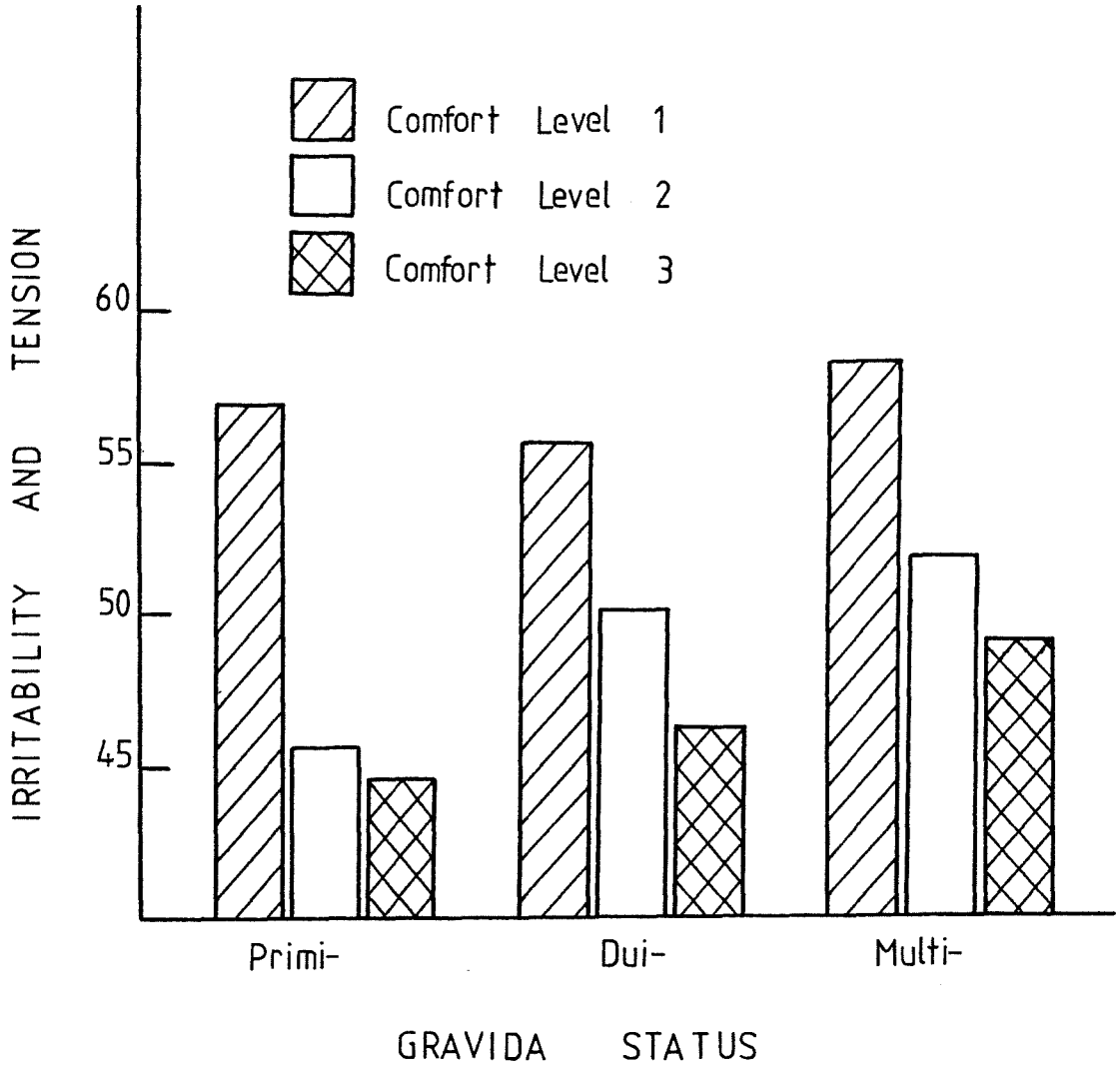

Fig. 6. Irritability and Tension scores for women in Comfort Levels 1, 2 and 3 classified according to Gravida Status.

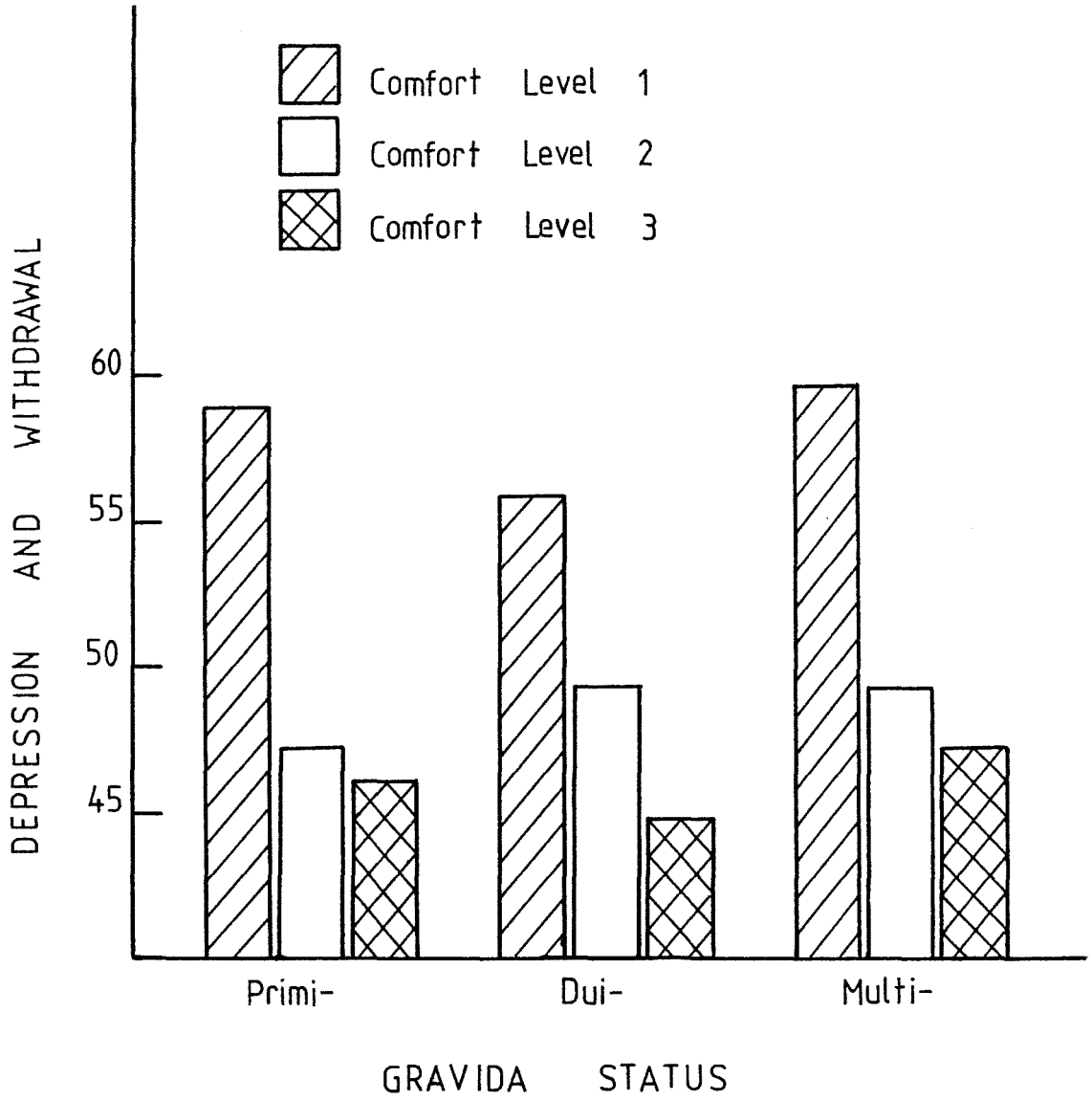

Fig. 7. Depression and Withdrawal scores for women in Comfort Levels 1, 2 and 3 classified according to Gravida Status.

would appear that the strongest differences are between Comfort level 1 and the other Comfort levels, rather than between the three gravida groups. In other words, it appears that lack of financial security is a stronger influence on the anxiety-related measures than is Gravida Status. While a number of studies have concentrated on the division between women experiencing their first pregnancies and those experiencing subsequent pregnancies, the present results indicate that this is not such an important influence on anxiety- related measures as is level of financial security. At the same time, the fact that Gravida Status does contribute to the level of Comfort needs to be noted.

Comfort Score and Trimester

It seems that since pregnancy is a developmental process, there may be changes in the woman's emotional and psychological state that are a function of the stage of pregnancy reached rather than other environmental factors. Analyses involving contrasts between Comfort score and Trimester were thus undertaken. Trimester was used rather than month of pregnancy because there were not enough subjects in some months to make complete analyses by months possible (this was particularly true of the early months of pregnancy). Moreover, trimester is very frequently used in medical literature to indicate the developmental stage reached by the pregnant woman.

The MANOVA for Comfort score and Trimester yielded

significant interaction effects (Tables 13 and 14) and significant main effects for both Comfort and Trimester (Tables 15 and 16). Significant univariate interaction effects were obtained on Anxiety, Fears for Self, Fears for Baby, and Maternal Feelings, and simple effects analyses were undertaken on these variables.

The simple effects analyses for Anxiety revealed that there were significant results within Trimester 1 ($F(4,245) = 4.93$, $p<0.01$), Trimester 2 ($F(4,245) = 3.39$, $p<0,05$), and Trimester 3 ($F(4,245) = 7.37$, $p<0.01$). Simple effects analyses for Comfort revealed that there were significant results within Comfort level 1 ($F(4,245) = 5.98$, $p<0.01$) and Comfort level 3 ($F(4,245) = 5.13$, $p<0.01$). Newman-Keuls tests on these results indicated that within Comfort level 1, women in the second ($\bar{X} = 56.89$) and third ($\bar{X} = 59.25$) trimesters of pregnancy were significantly more anxious than women in the first ($\bar{X} = 47.36$) trimester, but the difference between the second and third trimester groups was not significant. Within Comfort level 3, the simple effects analyses indicated a difference between Trimester groups, but subsequent comparisons of means showed that the differences between Trimester 1 ($\bar{X} = 40.01$) and Trimester 2 ($\bar{X} = 47.82$), and Trimester 1 and Trimester 3 ($\bar{X} = 46.19$) while sizeable were not quite large enough to be significant at the 0.05 level of confidence. Within Trimester 1, Comfort level 1 ($\bar{X} = 47.36$) and Comfort level 2 ($\bar{X} = 51.26$) were both significantly more anxious than Comfort level 3 ($\bar{X} = 40.01$).

Table 13

Summary of Multivariate Analysis of Variance: Interaction Effects between Comfort Level and Trimester

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 4	1.72	40.00	896.74	0.004	0.36
2 through 4	1.30	27.00	694.88	0.144	0.27
3 through 4	1.04	16.00	474.00	0.408	0.24
4 through 4	0.40	7.00	237.50	0.904	0.11

UNIVARIATE F TESTS

Variable	F(4,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1	2
Anxiety during Pregnancy	2.38	211.76	0.052	0.61	-0.54
Sleep Disturbance	2.14	198.51	0.076	-0.08	0.16
Nausea	0.55	54.20	0.695	-0.13	0.43
Fears for Self	3.40	321.05	0.010	-0.03	-0.92
Desire for Pregnancy	0.27	17.45	0.895	-0.25	0.12
Dependency	0.60	59.81	0.664	-0.44	-0.07
Fears for Baby	3.88	374.47	0.004	0.65	0.37
Irritability and Tension	1.15	100.59	0.335	0.26	0.60
Maternal Feeling	2.47	228.59	0.040	0.74	0.27
Depression and Withdrawal	1.86	154.06	0.118	-0.48	-0.52

Table 14

Summary of Means and Standard Deviations for Comfort Level and Trimester

GROUPS				VARIABLE									
Trimester	Comfort Level	N	M SD	Anxiety dur.Prg	Sleep Dist.	Nausea	Fears Self	Desire Preg.	Depend -ency	Fears Baby	Irrit. &Tens.	Matern. Feeling	Depress. &Withdr.
1	1	7	M	47.36	46.76	58.32	41.37	57.90	48.92	44.11	47.40	50.90	49.12
			SD	5.75	8.24	10.62	10.82	13.43	11.27	9.69	7.37	10.45	5.15
	2	12	M	51.26	51.15	51.53	50.93	43.86	48.75	54.24	47.15	56.62	49.86
			SD	11.83	12.77	11.32	10.37	2.15	12.64	8.09	9.19	9.71	10.00
	3	5	M	40.01	46.48	50.33	52.62	43.16	53.45	44.96	39.14	42.21	44.03
			SD	7.85	10.07	7.83	6.74	1.62	3.68	4.91	9.12	6.69	9.44
2	1	14	M	56.89	58.35	54.54	52.81	63.56	52.30	52.18	58.97	52.68	60.45
			SD	11.07	10.41	10.83	9.31	9.87	10.51	13.25	7.71	7.57	8.74
	2	85	M	49.95	48.22	49.71	49.34	47.50	49.36	48.30	48.61	49.92	48.13
			SD	9.92	9.45	10.12	9.21	7.25	10.04	8.76	9.41	9.63	8.66
	3	17	M	47.82	48.62	51.40	48.37	46.84	46.99	53.76	47.92	52.24	46.61
			SD	9.57	7.27	11.47	10.36	7.16	11.00	11.58	10.34	7.89	10.07
3	1	23	M	59.25	56.87	52.34	56.80	62.37	53.13	55.23	58.29	51.81	59.61
			SD	8.62	11.66	9.88	9.84	12.09	10.19	11.84	11.18	13.03	10.29
	2	68	M	48.42	50.28	49.07	49.64	48.35	50.28	50.19	50.15	48.02	49.78
			SD	8.74	9.62	9.51	10.10	8.07	8.72	9.78	9.20	9.56	9.50
	3	23	M	46.19	46.61	45.93	47.48	45.39	48.48	47.72	46.95	46.93	45.46
			SD	8.82	7.20	7.18	9.86	4.30	11.01	9.26	8.45	8.07	7.93

Within Trimester 2, Comfort level 1 ($\bar{X}$ = 59.25) was significantly more anxious than Comfort level 3 ($\bar{X}$ = 47.82), and within Trimester 3, Comfort level 1 ($\bar{X}$ = 59.25) was significantly more anxious than both Comfort levels 2 ($\bar{X}$ = 48.42) and 3 ($\bar{X}$ = 46.19). These interaction effects are presented in Figure 8.

In brief, it appears that women in Comfort level 1 (i.e., women who are financially insecure) are more anxious during the second and third trimesters than women in the other two Comfort groups, but during the first trimester, the women in Comfort level 2 (i.e., financially secure) were also significantly more anxious than women in Comfort level 3 (financially very secure). It is interesting to note that during the first trimester, women in Comfort level 2 were more anxious than women in Comfort level 1, although not significantly so.

The simple effects analyses for Fears for Self revealed significant results within Trimester 1 ($F(4,245) = 5.23$, $p<0.01$) and Trimester 3 ($F(4,245) = 4.82$, $p<0.01$). The Newman-Keuls tests on these results indicated that within Trimester 1, Comfort level 2 ($\bar{X}$ = 50.93) and Comfort level 3 ($\bar{X}$ = 52.62) both have significantly higher Fears for Self than Comfort level 1 ($\bar{X}$ = 41.37). Within Trimester 3, the position changes. Women in Comfort level 1 ($\bar{X}$ = 56.80) had significantly more Fears for Self than those in Comfort level 3 ($\bar{X}$ = 47.48), and also more than those in Comfort level 2 ($\bar{X}$ = 49.64) - although the last

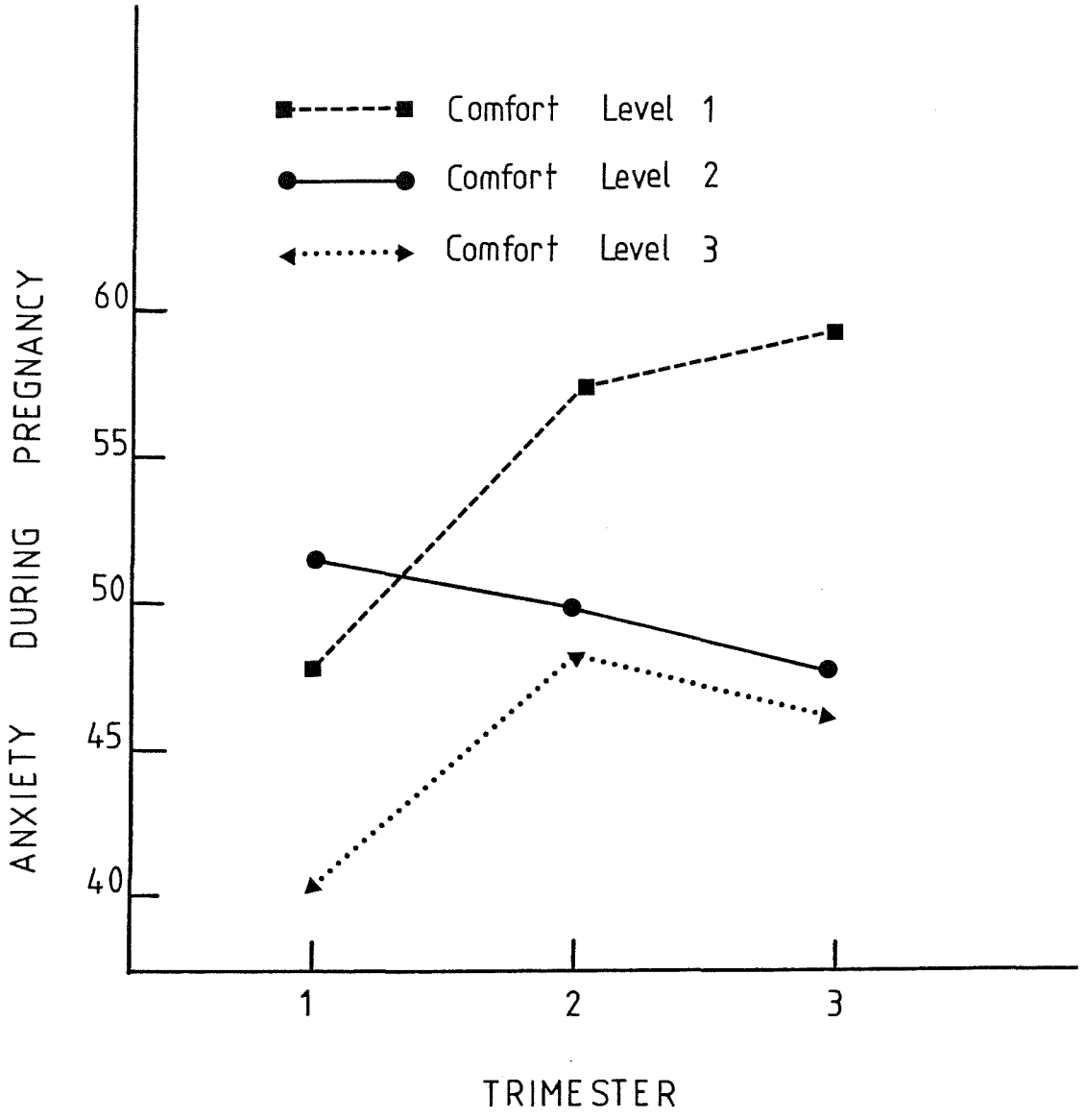

Fig. 8. Anxiety during Pregnancy scores for women classified according to their Comfort Level and Trimester of Pregnancy.

difference was not quite significant. The simple effects analyses for Comfort score revealed that there were significant results within Comfort level 1 ($F(4,245) = 9.12$, $p<0.01$). Newman-Keuls tests on these results indicated that women within Comfort level 1 had significantly more Fears for Self in the second ($\bar{X} = 52.81$) and third ($\bar{X} = 56.80$) trimesters of pregnancy than in the first ($\bar{X} = 41.37$) trimester. However, the difference between the second and third trimesters was not significant. These results are summarized in Figure 9.

In brief, the results indicate that for the Comfort level 1 (financially insecure) women, the Fears they hold for themselves are significantly lower than for Comfort level 2 and 3 women during the first trimester. The position changes during the second and third trimesters for Comfort level 1 women had significantly more Fears for themselves than women in Comfort level 3, and more than women in Comfort level 2 but this difference was not quite significant.

The simple effects analyses for Fears for Baby indicated that there were significant results within Trimester 1 ($F(4,245) = 4.40$, $p<0.05$). Newman-Keuls tests on these results indicated that women in the Comfort level 2 held significantly more Fears for the Baby than women in either of the other two Comfort groups. The means for Comfort levels 1, 2 and 3 were 44.11, 54.24 and 44.96 respectively. There were also significant results within Comfort level 1 ($F(4,245) = 4.60$, $p<0.05$).

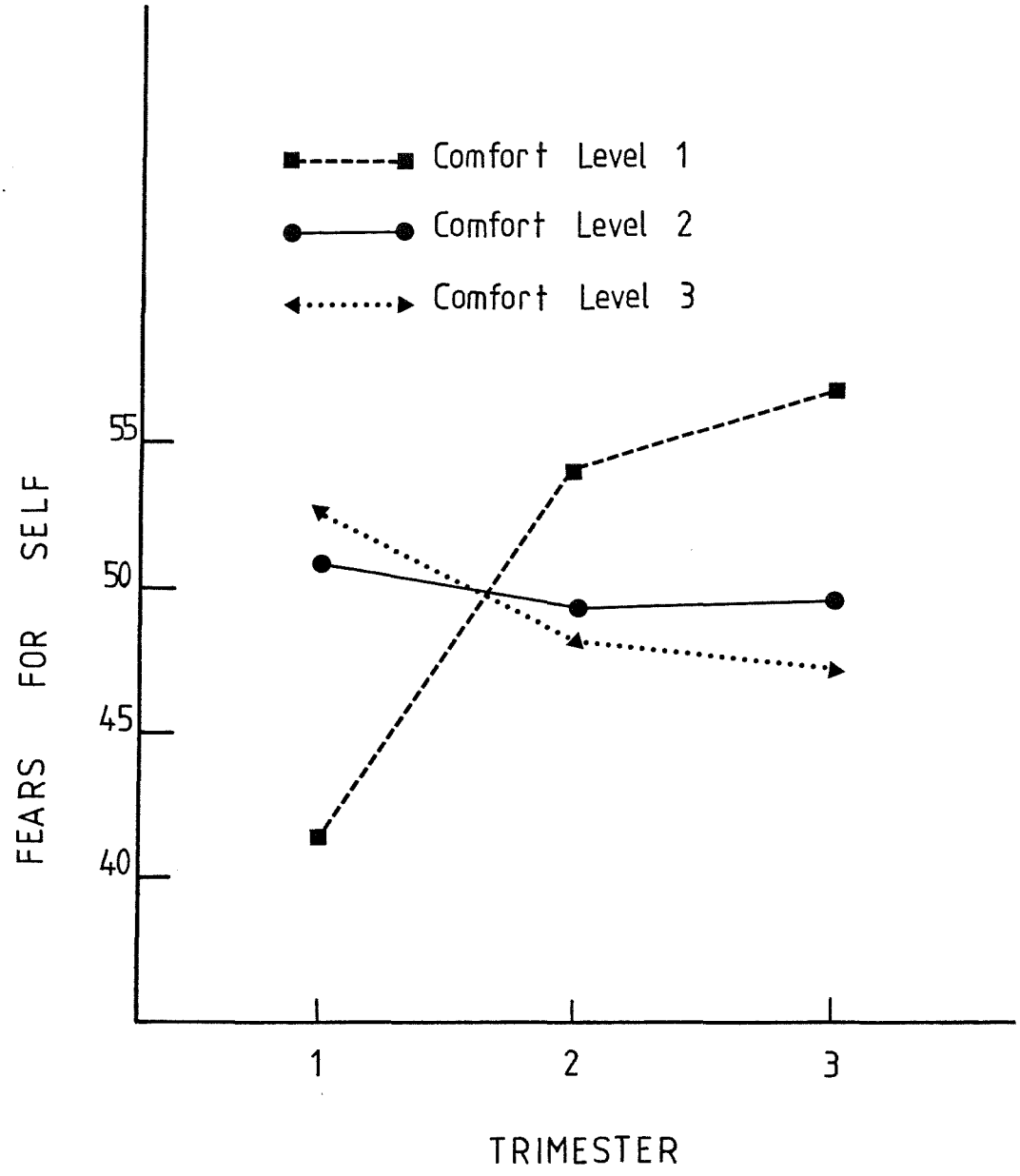

Fig. 9. Fears for Self scores for women classified according to their Comfort Level and Trimester of Pregnancy.

Newman-Keuls tests on these results indicated that women within Comfort level 1 had more fears for their babies during the second and third trimesters than in the first trimester. These results are summarized in Figure 10.

The simple effects analyses of Comfort score for Trimester on Maternal Feelings indicated that there were significant results within Trimester 1 ($F(4,245) = 7.64$, $p<0.01$). Newman-Keuls tests on these results indicated that women in Comfort level 1 ($\bar{X} = 50.89$) and Comfort level 2 ($\bar{X} = 56.62$), both had significantly less maternal feelings than women in Comfort level 3 ($\bar{X} = 42.21$). This seems a somewhat unexpected result, for women in Comfort level 2 (financially secure) had less maternal feeling than women in Comfort level 1 (financially insecure) although this result was not quite significant. It would perhaps be expected that women who are financially insecure would demonstrate less maternal feeling than women who are relatively secure financially, although it is also true that strong maternal feelings can be held by women who do not want a pregnancy during periods of financial hardship. Simple effects analyses of Trimester for Comfort score on Maternal Feelings indicated that there were significant results within Comfort level 2 ($F(4,245) = 5.42$, $p<0.01$) and Comfort level 3 ($F(4,245) = 3.68$, $p<0.05$). Newman-Keuls tests indicated that within Comfort level 2, there was less Maternal Feeling apparent in the second and third trimesters than in the first trimester but this result was not quite significant. Within Comfort level 3, there

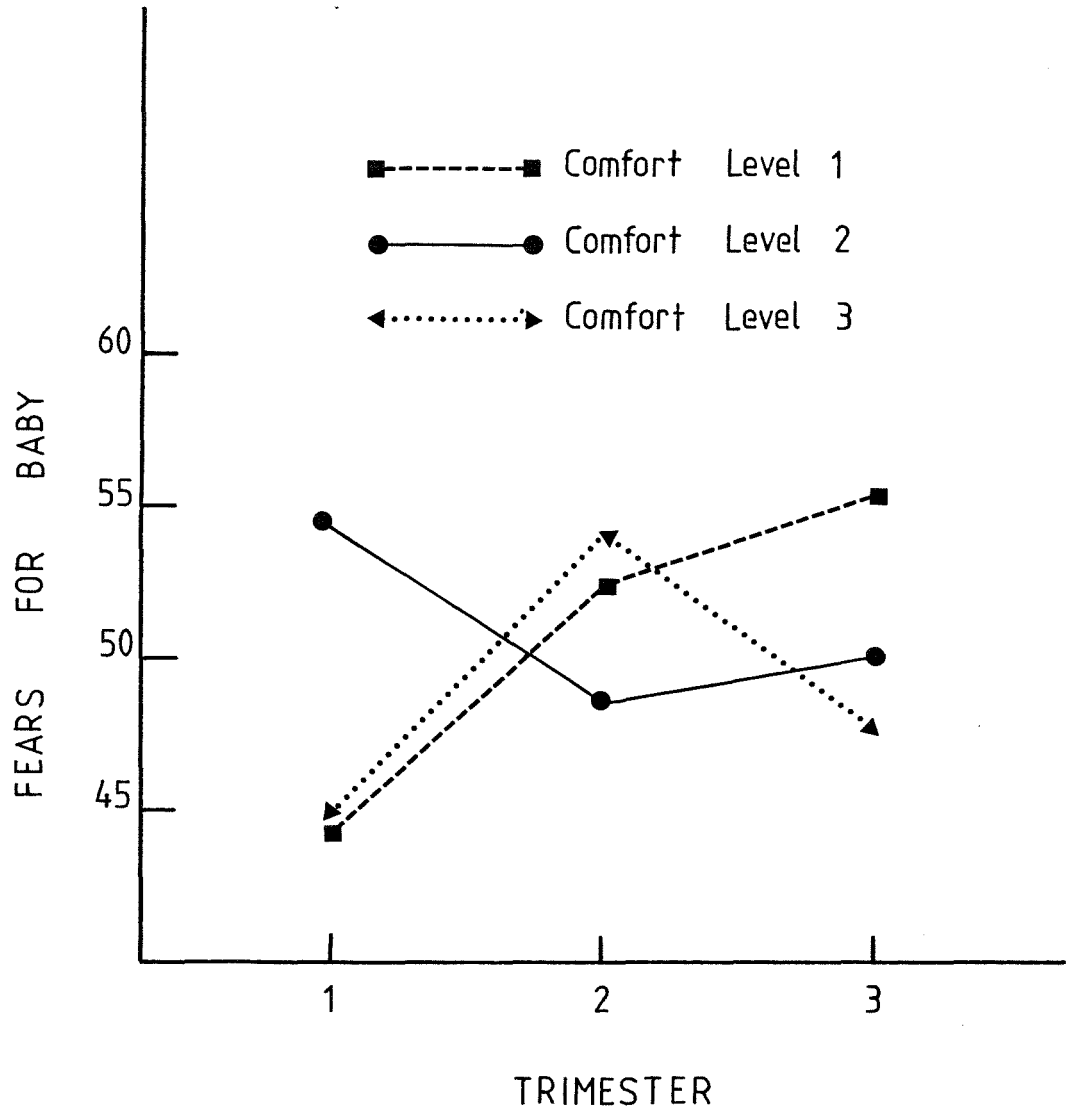

Fig. 10. Fears for Baby scores for women classified according to Comfort Level and Trimester of Pregnancy.

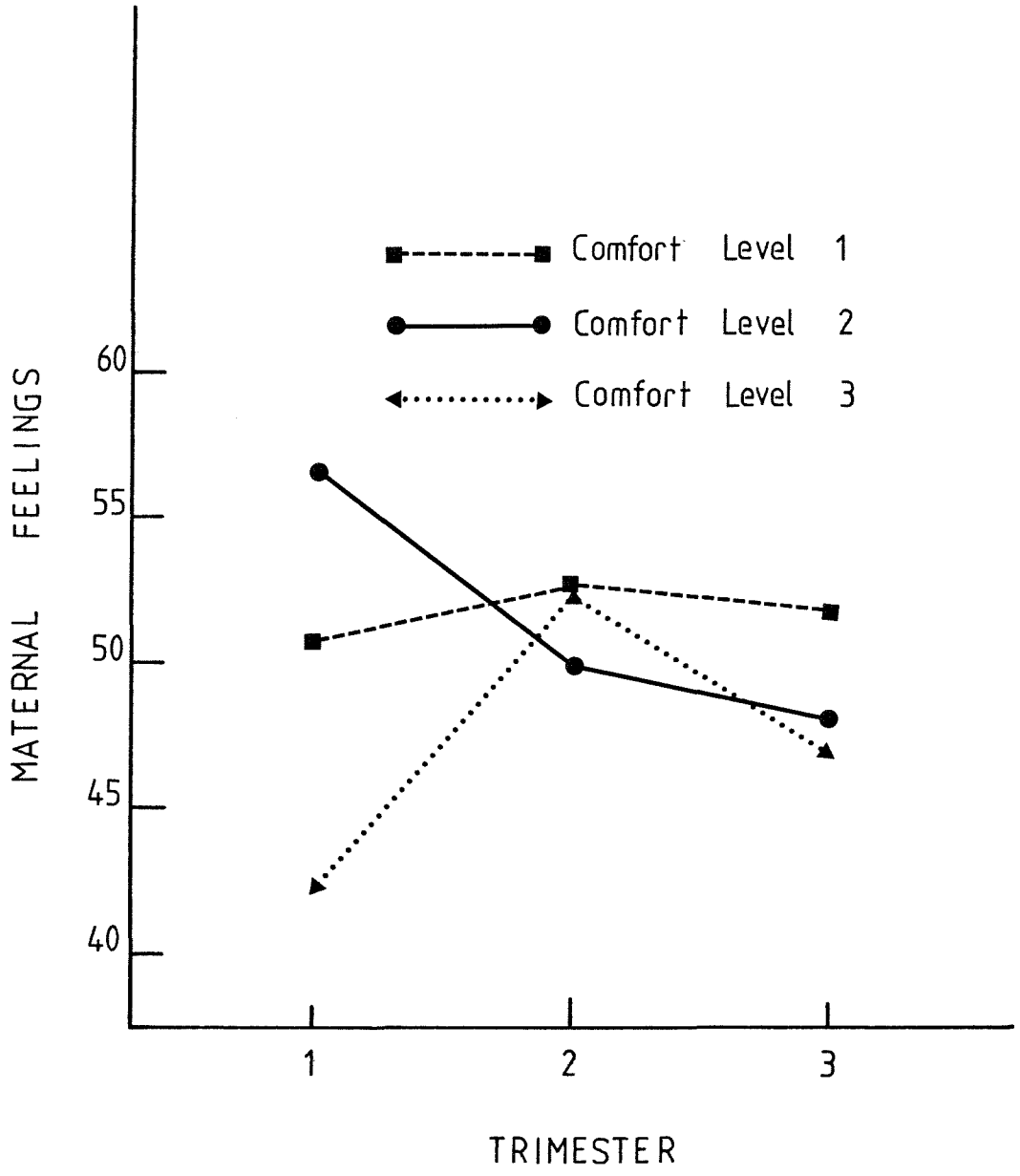

Fig. 11. Maternal Feelings scores for women classified according to Comfort Level and Trimester of Pregnancy.

was significantly less Maternal Feeling displayed in the second trimester ($\bar{X}$ = 52.24) than in the first trimester ($\bar{X}$ = 42.21), but the difference between the second and third ($\bar{X}$ = 46.93) trimesters was not significant. These results are summarized in Figure 11 (as for previous analyses, the higher the score on a particular measure, the less "desirable" the woman's condition is considered to be).

Significant univariate main effects for Comfort and Trimester were obtained on several other variables including Sleep Disturbance, Nausea, Desire for Pregnancy, Depression and Withdrawal, and Irritability and Tension (Tables 15 and 16). Newman-Keuls tests on Sleep Disturbance indicated that women in Comfort level 1 ($\bar{X}$ = 55.73) suffered significantly more Sleep Disturbance than women in Comfort level 2 ($\bar{X}$ = 49.28) and Comfort level 3 ($\bar{X}$ = 47.36). Newman-Keuls tests on the other variables indicated that women in Comfort level 1 ($\bar{X}$ = 53.99) suffered more Nausea than those in Comfort level 2 ($\bar{X}$ = 49.58) and Comfort level 3 ($\bar{X}$ = 48.49). Comfort level 1 women had less Desire for Pregnancy ($\bar{X}$ = 62.03) than those in Comfort level 2 ($\bar{X}$ = 45.69). Comfort level 1 women were also more Depressed and Withdrawn ($\bar{X}$ = 58.21) than those in Comfort level 2 ($\bar{X}$ = 48.93) and Comfort level 3 ($\bar{X}$ = 45.73). Finally, Comfort level 1 women were more Irritable and Tense ($\bar{X}$ = 56.77) than those in Comfort level 2 ($\bar{X}$ = 49.14) and Comfort level 3 ($\bar{X}$ = 46.45). This last variable also showed a Trimester main effect indicating that women

Table 15

Summary of Multivariate Analysis of Variance (Main Effects) of Comfort Level

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	7.05	20.00	472.00	0.001	0.63
2 through 2	0.37	9.00	236.00	0.948	0.12

UNIVARIATE F TESTS

Variable	F(2,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	15.70	1395.64	0.001	0.14
Sleep Disturbance	9.95	921.89	0.001	0.03
Nausea	4.14	403.78	0.017	0.01
Fears for Self	3.03	285.86	0.050	-0.15
Desire for Pregnancy	65.20	4158.36	0.001	0.90
Dependency	1.60	159.68	0.204	0.12
Fears for Baby	1.57	151.79	0.209	0.02
Irritability and Tension	16.31	1431.20	0.001	-0.13
Maternal Feeling	1.61	149.21	0.202	-0.24
Depression and Withdrawal	24.14	1999.90	0.001	0.41

Table 16

Summary of Multivariate Analysis of Variance(Main Effects) for Trimester

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	1.73	20.00	472.00	0.03	0.32
2 through 2	0.90	9.00	236.50	0.52	0.18

UNIVARIATE F TESTS

Variable	F(2,245)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	0.82	72.96	0.441	-0.12
Sleep Disturbance	0.78	71.91	0.461	0.23
Nausea	1.93	188.44	0.147	-0.57
Fears for Self	0.63	59.99	0.531	0.07
Desire for Pregnancy	1.47	93.96	0.231	0.40
Dependency	0.37	36.74	0.693	0.00
Fears for Baby	0.46	44.25	0.633	-0.01
Irritability and Tension	3.59	315.20	0.029	0.90
Maternal Feeling	1.93	178.59	0.148	-0.66
Depression and Withdrawal	1.16	96.53	0.314	-0.26

experienced more Irritability and Tension during the second trimester ($\bar{X}$ = 49.75) and third trimester ($\bar{X}$ = 51.14) than in the first trimester ($\bar{X}$ = 45.55). These results are summarized in Figures 12 - 16.

In summary, the exploratory analyses involving Comfort score and Trimester indicated that women in the Comfort level 1 (financially insecure) in comparison with women in the other two Comfort groups, appeared to be significantly more Anxious, and suffer significantly more from Sleep Disturbance, Nausea, Irritability and Tension, Depression and Withdrawal, and less Desire for Pregnancy. At the same time there were interaction effects between Comfort score and Trimester on several variables including Anxiety, Fears for Self, Fears for Baby, and Maternal Feelings. The results for Anxiety indicated that subjects showed significantly more anxiety during the second and third trimesters than in the first trimester - a result which could have been influenced by the fact that women within Comfort level 1 were significantly more anxious in the second and third trimesters than in the first trimester. These women also showed significantly more fears for themselves and for the baby in the second and third trimesters than in the first trimester. Comfort level 2 women had significantly more fears for themselves and the baby than women in the other two Comfort groups. Women in the Comfort level 3 showed significantly more Maternal Feelings in the first trimester than women in the

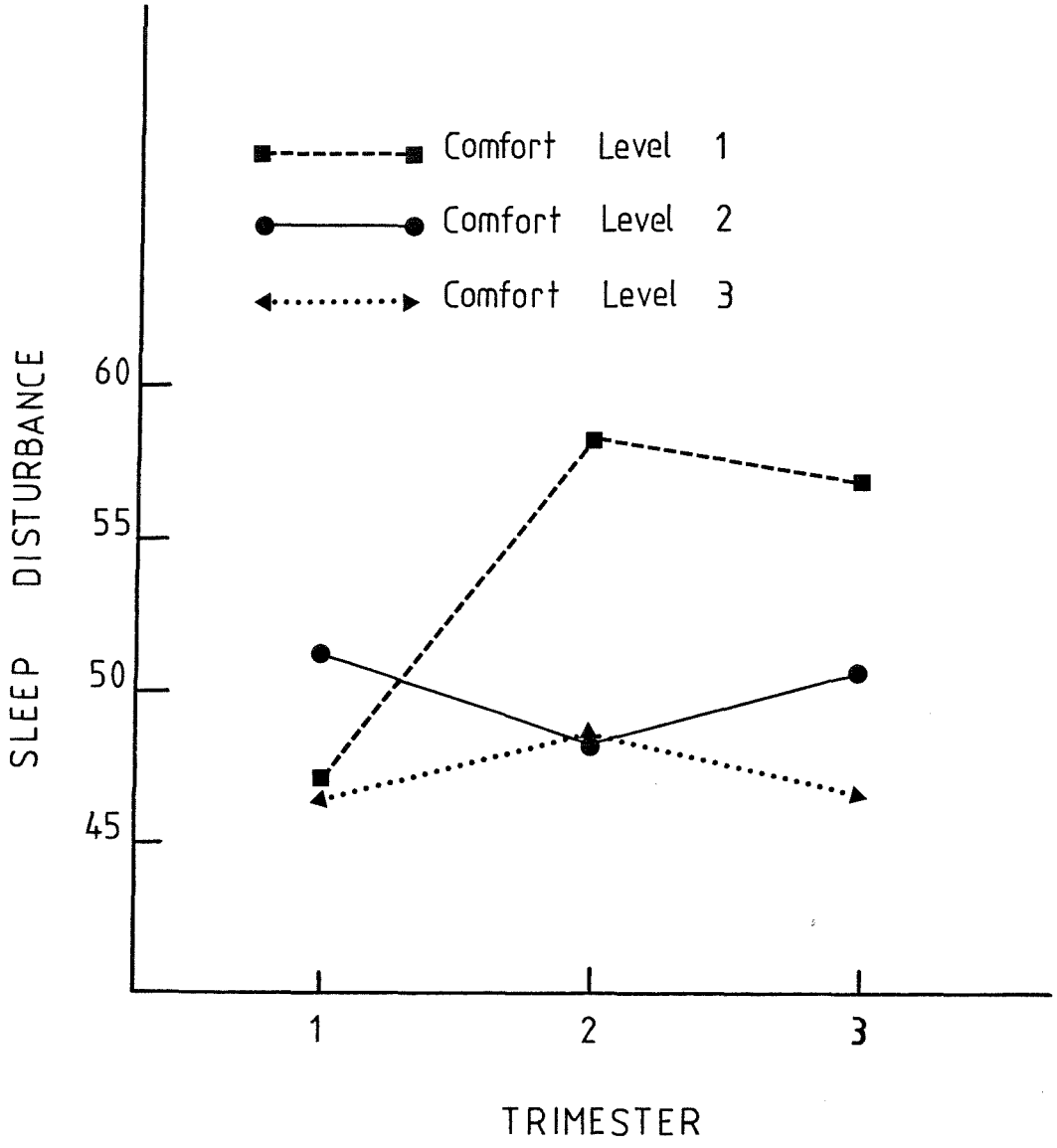

Fig. 12. Sleep Disturbance scores for women classified according to Comfort Level and Trimester of Pregnancy.

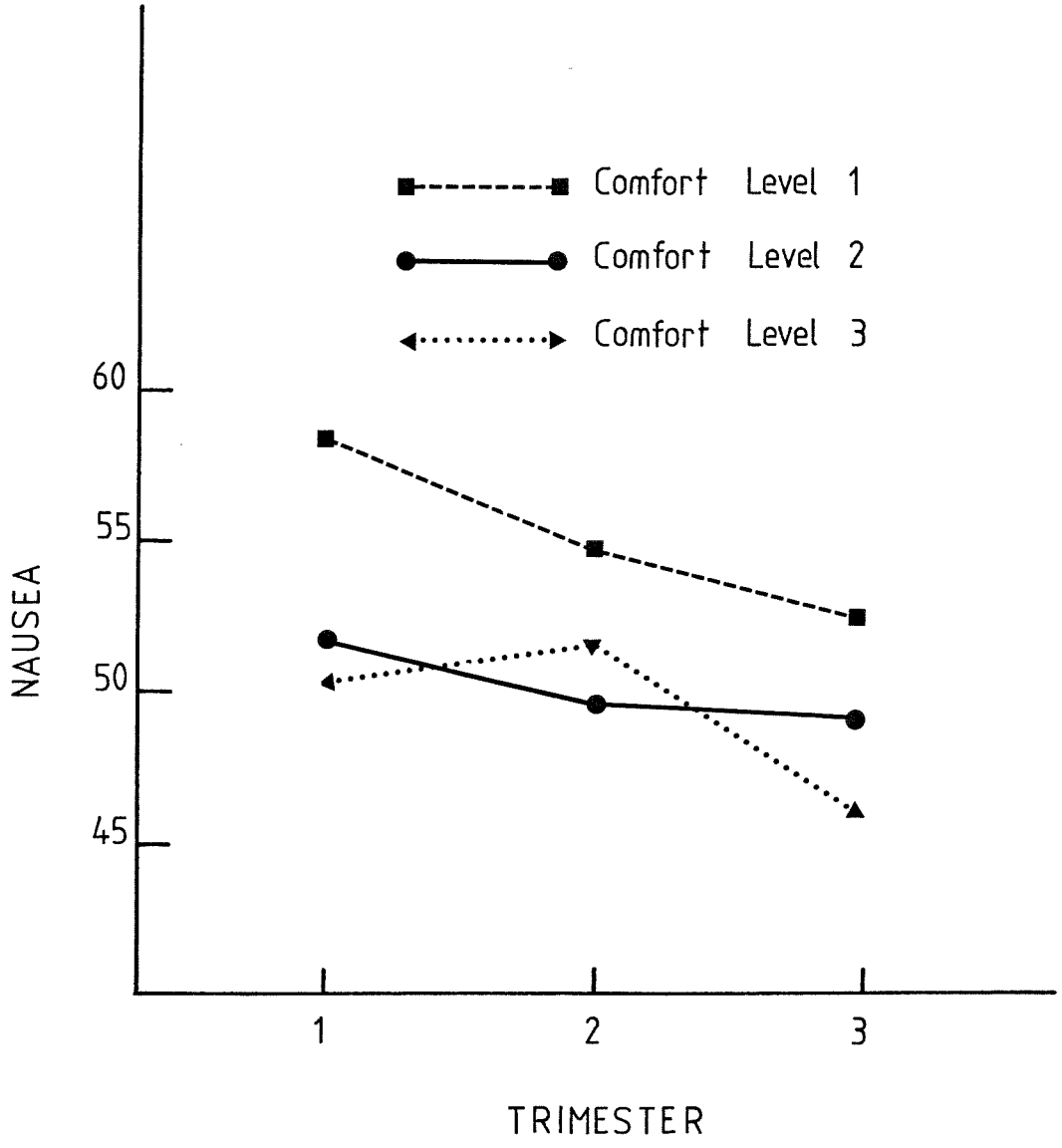

Fig. 13. Nausea scores for women classified according to Comfort Level and Trimester of Pregnancy.

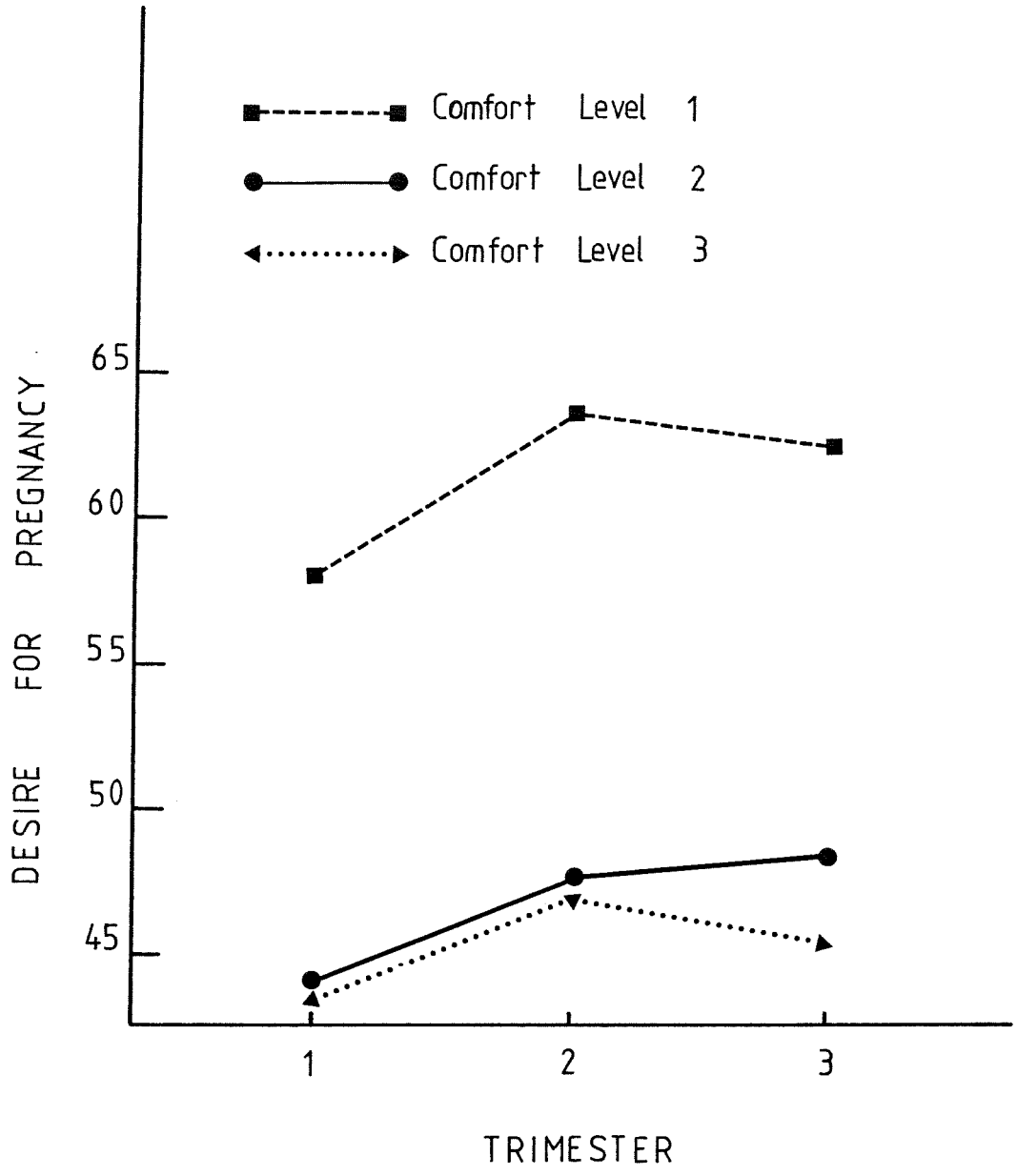

Fig. 14. Desire for Pregnancy scores for women classified according to Comfort Level and Trimester of Pregnancy.

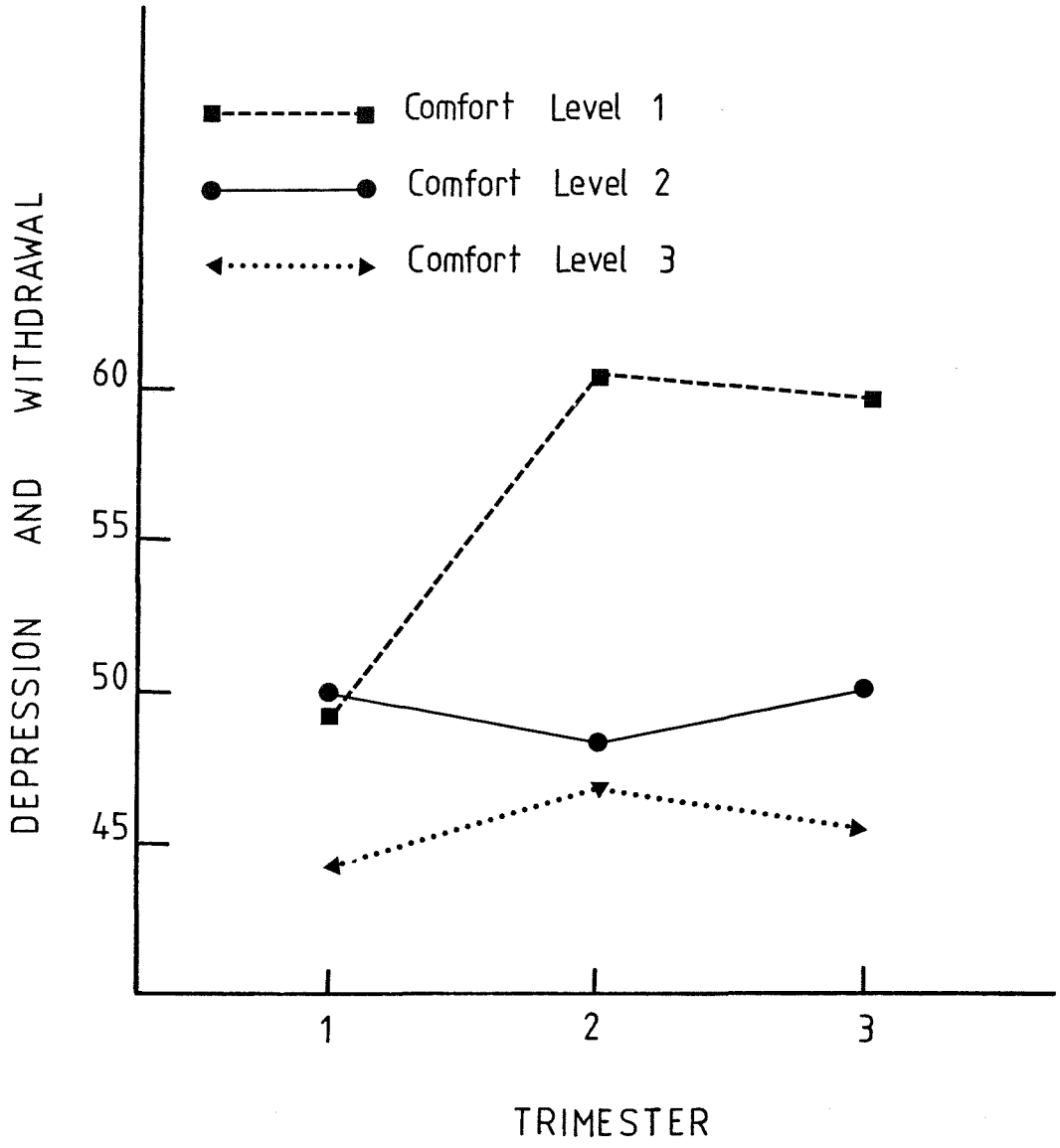

Fig. 15. Depression and Withdrawal scores for women classified according to Comfort Level and Trimester of Pregnancy.

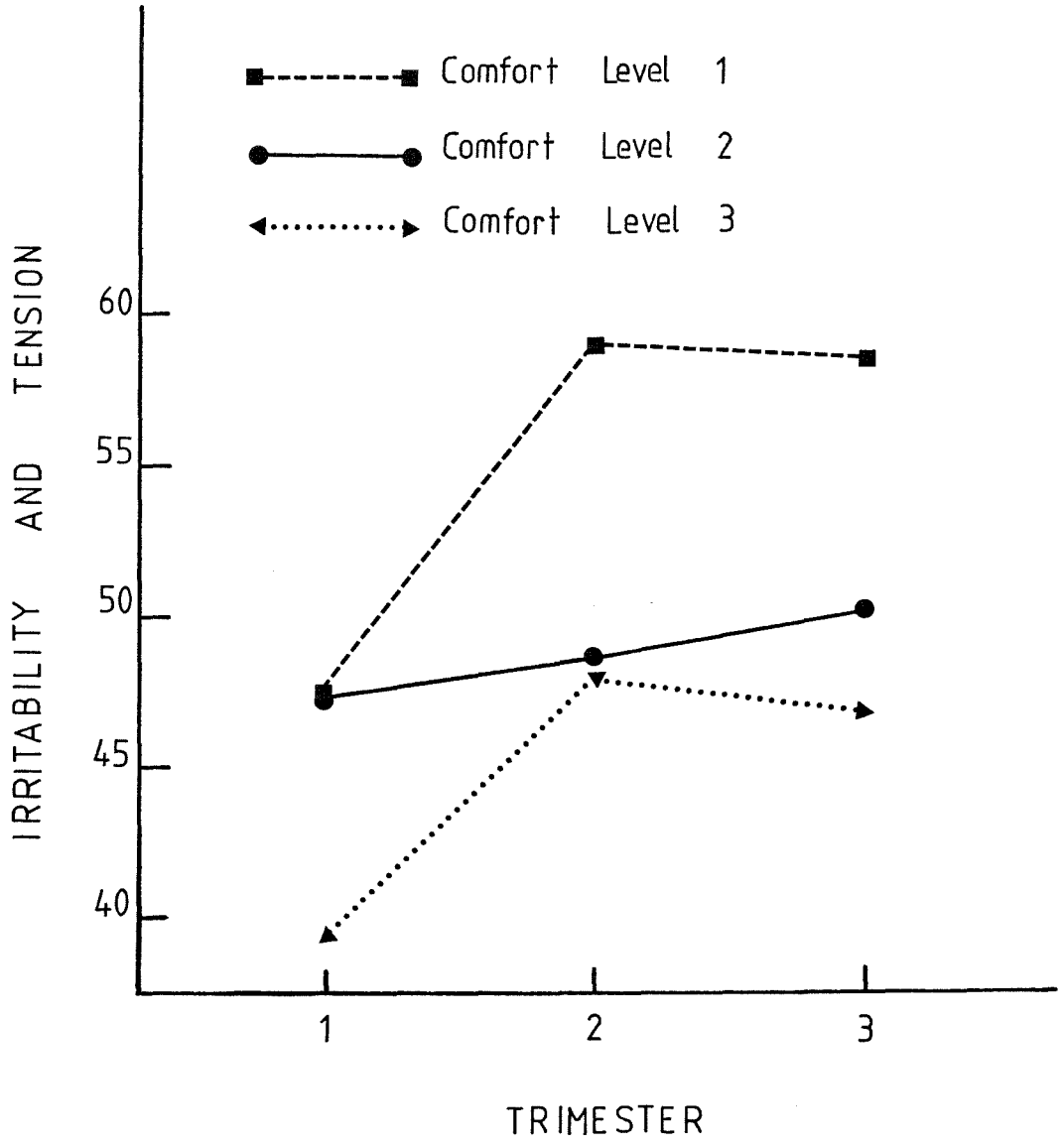

Fig. 16. Irritability and Tension scores for women classified according to Comfort Level and Trimester of Pregnancy.

other two Comfort groups but in the second trimester, Comfort level 3 women showed significantly less Maternal Feeling than in the first trimester.

Marital Status

Concern is generally felt by the community and health and social agencies for the single woman who becomes pregnant because often the pregnancy is unplanned and unwanted and results in considerable difficulty and emotional upset for the woman. It thus seemed important to look at this group of twenty subjects and see how they felt in relation to married subjects in the sample.

The age groupings for these single women were as follows: age 16 yrs (N = 3), 17-19 yrs (N = 3), 20 yrs (N = 2), 21-22 yrs (N = 5), 24-26 yrs (N = 2), 29 yrs (N = 1). (It is interesting to note that four of these single women did not give their ages, which raises the possibility that they may have been younger than 16 years.)

A multivariate analysis of variance was undertaken, contrasting single subjects with married subjects on the same psychological variables used in previous MANOVA's, with Marital Status and Trimester used as blocking factors. The MANOVA yielded significant main effects for both Marital Status and Trimester. A summary of these analyses is presented in Tables 17 and 18. (The table for Trimester main effects has been ommitted because the only significant result was obtained for Irritability and Tension

Table 17

Summary of Multivariate Analysis of Variance (Main Effects) of Marital Status

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 1	7.64	10.00	243.00	0.001	0.49

UNIVARIATE F TESTS

Varaiable	F(1,252)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	0.94	94.43	0.334	0.05
Sleep Disturbance	0.52	52.20	0.473	-0.07
Nausea	2.62	260.32	0.106	-0.43
Fears for Self	3.49	330.26	0.063	-0.06
Desire for Pregnancy	55.83	4517.69	0.001	1.05
Dependency	5.03	496.13	0.026	0.37
Fears for Baby	0.90	89.78	0.344	0.07
Irritability and Tension	3.78	370.25	0.053	-0.005
Maternal Feeling	1.53	152.68	0.217	-0.19
Depression and Withdrawal	3.78	376.44	0.053	-0.09

Table 18

Summary of Means and Standard Deviations for Multivariate Analysis of Variance of Marital Status and Trimester

GROUPS				VARIABLE								
Trimester	Married or Single	N	M SD	Anxiety dur.Prg	Sleep Dist.	Nausea	Fears Self	Desire Preg.	Depend -ency	Fears Baby	Irrit. &Tens.	Matern. Feeling	Depress. &Withdr.
1	S	3	M	50.47	52.38	48.07	33.44	49.98	46.18	41.97	48.87	51.84	50.13
			SD	6.32	8.51	3.78	1.25	9.92	10.56	7.69	9.66	10.07	7.37
	M	21	M	47.40	48.40	54.00	50.64	47.50	50.29	50.40	45.08	51.96	48.19
			SD	10.79	11.27	11.11	9.48	9.84	10.93	9.08	9.01	10.98	9.01
2	S	6	M	54.38	53.20	46.81	58.32	66.09	55.78	55.83	53.53	50.18	53.13
			SD	14.17	11.38	8.50	9.62	3.80	7.99	15.42	7.93	6.30	4.90
	M	111	M	50.22	49.24	50.65	49.17	48.59	49.11	49.26	49.48	50.68	49.16
			SD	9.99	9.69	10.52	9.15	8.64	10.26	9.53	9.97	9.31	9.86
3	S	11	M	50.91	50.59	46.01	57.11	67.44	56.78	52.83	55.70	54.03	55.98
			SD	9.99	12.09	8.99	9.08	12.44	11.74	11.85	9.16	14.11	13.21
	M	106	M	49.92	50.80	49.17	50.00	49.25	49.95	50.30	50.76	48.42	50.44
			SD	9.78	9.91	9.34	10.47	8.96	9.24	10.14	10.13	10.13	10.13

which has already been discussed in the Comfort x Gravida and Comfort x Trimester analyses.) Significant univariate main effects for Marital Status were obtained on four variables, viz., Desire for Pregnancy, Dependency, Irritability and Tension, and Depression and Withdrawal. According to the results, single women appeared to desire their pregnancy less ($\bar{X}$ = 64.42) than married women ($\bar{X}$ = 48.79). (As mentioned previously, for all of these variables, the higher the score, the less "desirable" the subject's condition was considered to be.)Single women appeared to be more dependent ($\bar{X}$ = 54.89) than married women ($\bar{X}$ = 49.59) and were also more irritable and tense ($\bar{X}$ = 54.02) than married women ($\bar{X}$ = 49.66). Finally, single women appeared to be more depressed and withdrawn ($\bar{X}$ = 54.25) than married women ($\bar{X}$ = 49.64). These results are presented in Figures 17 - 20.

It would appear from these results that the single women were manifesting more adverse psychological reactions than the married women in this sample - a matter for concern since all but four of the single women stated that they intended to keep their babies. It is important to note that at the time this study was being undertaken, new legislation was being drafted which made it more difficult for women to obtain abortions, and at the same time, a sizeable 'domestic purposes benefit' plus low interest rates for loans on new homes, were available to single women with a baby. One cannot help wondering to what degree, the decision of

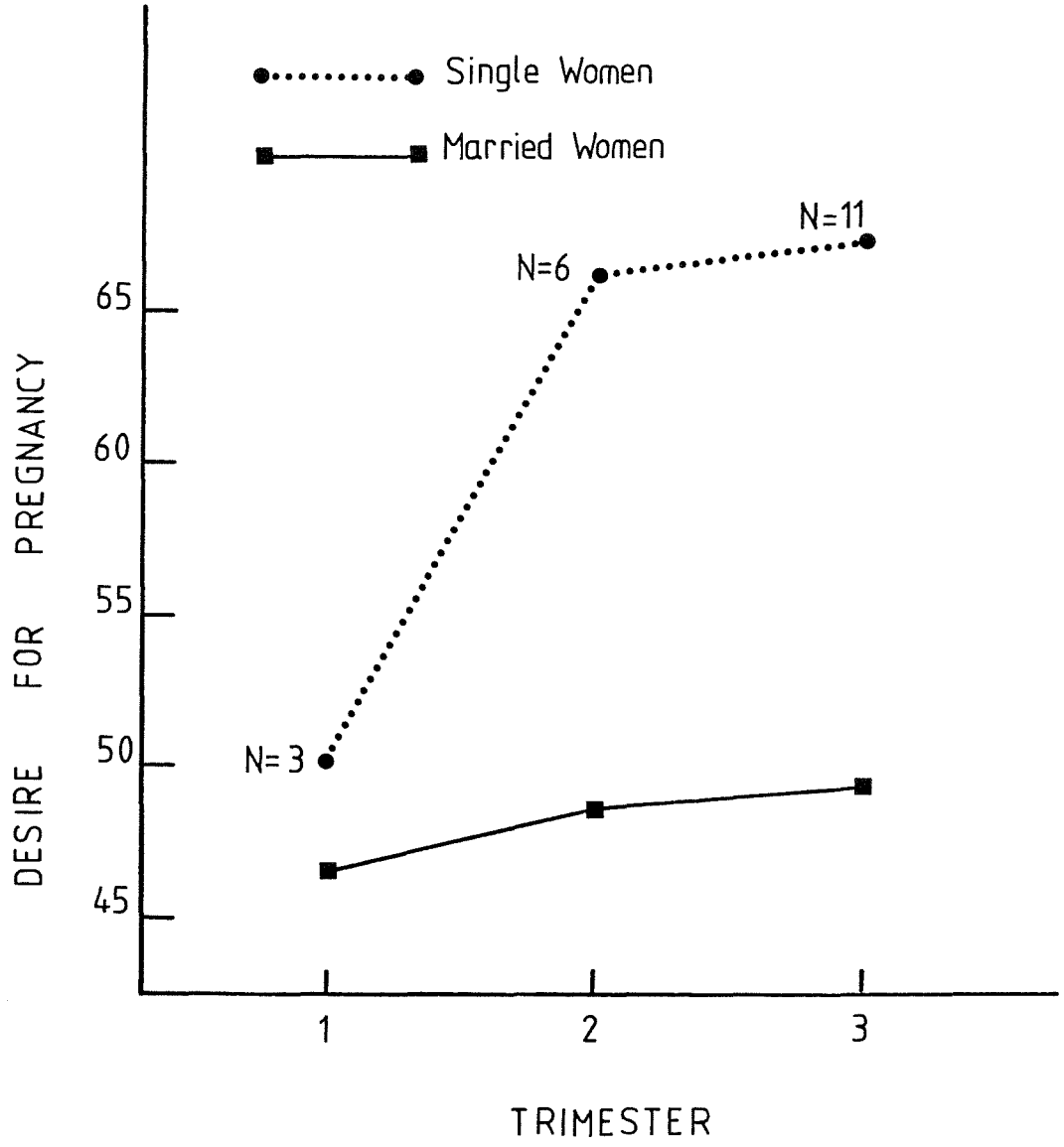

Fig. 17. Desire for Pregnancy scores for women classified according to Comfort Level and Trimester of Pregnancy.

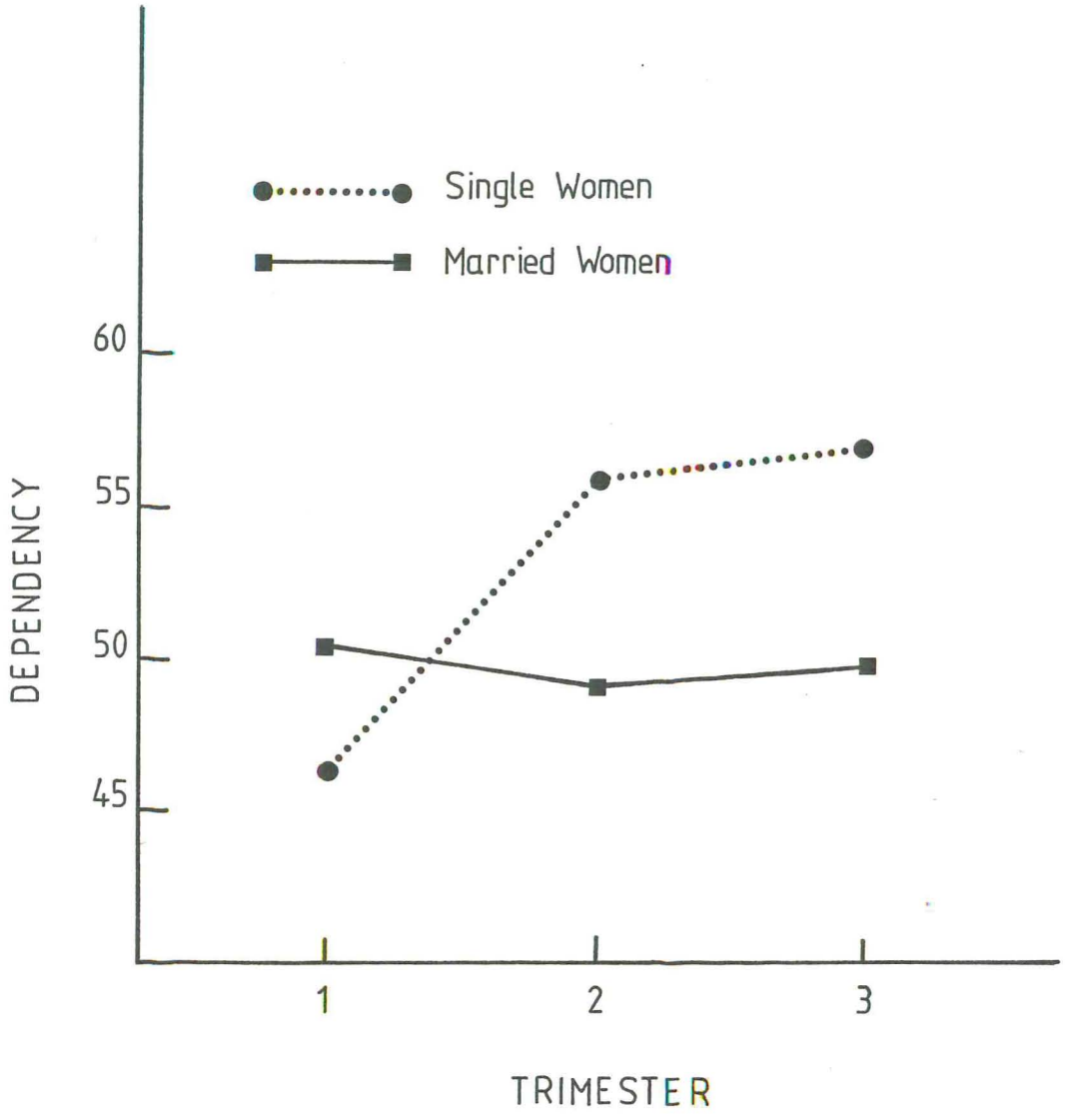

Fig. 18. Dependency scores for unmarried and married women classified according to Trimester of Pregnancy.

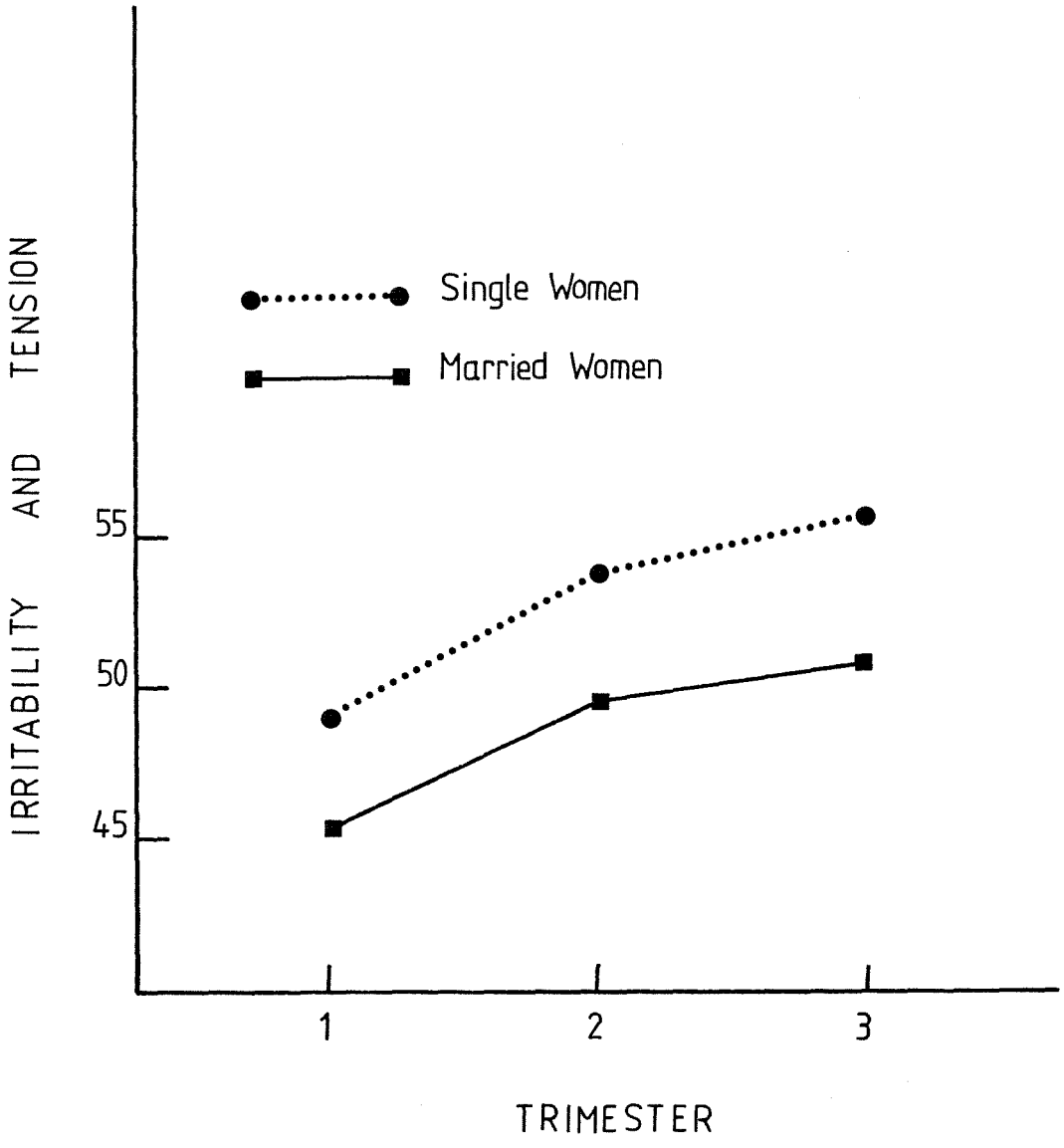

Fig. 19. Irritability and Tension scores for married and unmarried women classified according to Trimester of Pregnancy.

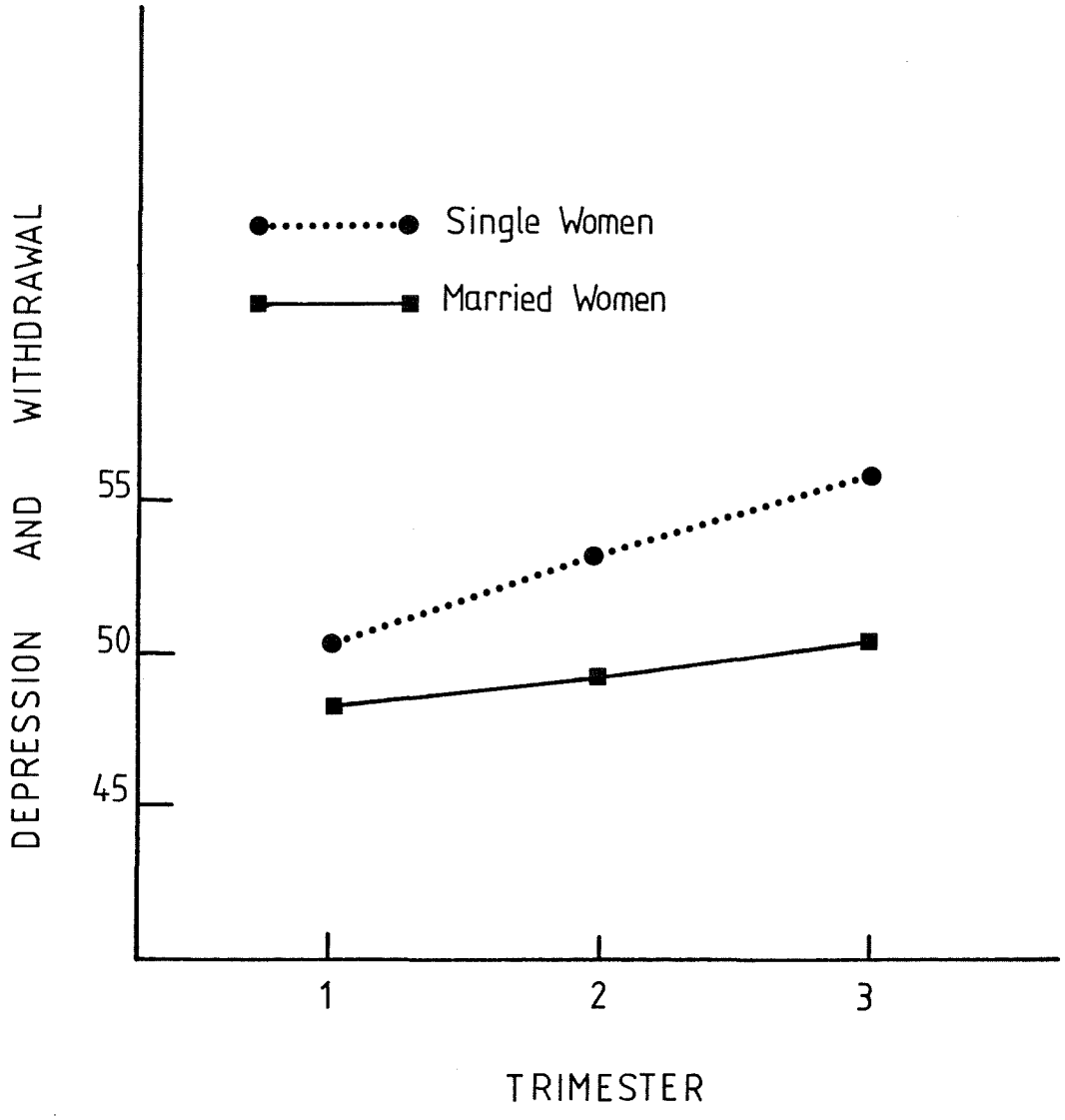

Fig. 20. Depression and Withdrawal scores for married and unmarried women classified according to Trimester of Pregnancy.

these single women to keep their babies despite the emotional difficulties they were facing, was influenced by the availability of the benefit and housing finance, and the consequences of the abortion legislation.

Antenatal Class Attendance

The initial aim of this study was to investigate the possibility that while pregnant women characteristically show some degree of anxiety, those who are attending antenatal classes (or have attended in the past) would be less anxious than those who do not attend such classes. Accordingly, a comparison was made between three groups: a) women who were attending an antenatal course at the time they answered the questionnaire; b) women who were not attending antenatal classes but had at some time in the past; and c) women who were not attending antenatal classes and never had. The data obtained from these three groups were included in the analyses undertaken to predict anxiety-related states and although antenatal status did make a significant contribution to the prediction of these states, it was not a strong predictor. In fact, the strongest position attained as a predictor was seventh (Table 28, Appendix C). The strongest predictor appeared to be Comfort score. This raises the possibility that perhaps women who attend antenatal classes are not representative of the sample of women included in this study with respect to Comfort score.

The possibility could not be discounted that women who were financially insecure did not attend antenatal classes. Accordingly, an analysis was made of the Comfort levels of women who were attending antenatal classes at the time they answered the PRQ. (The results are summarized in Table 19.) The percentages of women in Comfort levels 1, 2 and 3 for the total sample of women in this study were: 17.32, 64.96 and 17.72 respectively. The corresponding percentages of women who were actually attending classes when they answered the PRQ reveal that 22.72 percent of Comfort level 1 women, 35.75 percent of Comfort level 2 women and 44.44 percent of Comfort level 3 women were in this position. A further 29.54 percent of Comfort level 1 women, 32.73 percent of Comfort level 2 women and 40.00 percent of Comfort level 3 women were not attending antenatal classes at the time of answering the PRQ but had attended such classes in the past. In brief, the total proportions of women who were either attending antenatal classes or had attended such classes previously at the time of answering the PRQ were as follows: Comfort level 1 (financially insecure) = 52.77 percent, Comfort level 2 = 68.48 percent, and Comfort level 3 = 84.44 percent.

It appears from these results that the more financially secure a pregnant woman is, the more likely she is to attend antenatal classes. This raises an important question - "Why is the proportion of women from Comfort level 1 who attend antenatal classes smaller than is the

Table 19

Frequencies and Proportions of Women in each Comfort Level according to Information on Antenatal Class Attendance

Antenatal Class Attendance	Comfort Level		
	1	2	3
1. Number of women in each comfort level for the total sample in the study.	44 = 17.32%	165 = 64.96%	45 = 17.72%
2. Proportion of women in each comfort level for the total sample who were attending AN classes at the time of answering the questionnaire.	10/44 = 22.72%	59/165 = 35.75%	20/45 = 44.44%
3. Proportion of women in each comfort level for the total sample who were not attending AN classes but had in the past.	13/44 = 29.54%	54/165 = 32.73%	18/45 = 40.00%
Totals for categories 2 and 3 above.	23/44 = 52.77%	113/165 = 68.48%	38/45 = 84.44%

case for women in the other two comfort levels?" Perhaps such classes are less attractive to comfort level 1 women than to other women, or perhaps they are simply less accessible to poorer women. During the interviews held with the doctors when the study was being organized, the majority of doctors reported that they considered it important for women to attend classes for childbirth preparation. In fact, of all the doctors interviewed, only two stated that they regarded antenatal classes as a waste of time. Despite this fact, it appears from the results of this study that one group of women - those in Comfort level 1 who are likely to be more anxious than women in the other two groups, are actually less likely to attend antenatal classes. It could be argued that women in Comfort level 1 may have more children and therefore may be more likely to have attended antenatal classes in the past for previous pregnancies but this does not seem to be the case. The results indicate (Table 19) that 29.54 percent of Comfort level 1 women had attended classes previously compared with 32.73 percent of Comfort level 2 and 40.00 percent of Comfort level 3 women. It thus seems to be the case that comfort level 1 women (who are likely to be the more anxious women) are less likely to attend antenatal classes than women from the other two groups.

It is possible that women in comfort level 1 either could not afford to attend the classes and/or were unable to arrange care for their other children

whilst attending the classes, or alternatively, they may have to work during their pregnancies and take care of household duties at night making attendance at classes impractical. A further possibility is that women in comfort level 1 may not have wanted to attend such classes either because they did not consider them necessary or because they preferred to remain ignorant of the experience they were about to encounter. Another possibility is that women in comfort level 1 had difficulty in finding transport to take them to the classes.

Another matter for consideration was whether or not the anxiety level of women differed according to the particular antenatal course they had attended. An analysis of variance (ANOVAN) was undertaken to compare the mean anxiety levels of women attending the various antenatal classes. The results indicated that there was no significant difference between the groups attending the various courses. There was however, a noticeable difference between the two courses with the most extreme means, i.e., Course No. 1 and Course No. 6 (Table 20) - a difference which could in part be due to the fact that the former is a large hospital class and the second a small private hospital class. Course No. 6 could perhaps have a more personal atmosphere than Course No. 1 but it was also apparent that all women who attended Course No. 6 were either financially secure or very secure, whilst women attending Course No. 1 were from all three comfort levels. It is also possible that since the large

Table 20

Mean Anxiety Level for Women in each Antenatal Course

Course Number	N	Mean
1	32	73.56
2	8	65.26
3	18	65.33
4	4	65.50
5	19	69.95
6	5	59.08
7	6	64.00
9	1	60.00

*Course No. 8 was not attended by any women in this study.

hospital class is conducted at a teaching hospital which tends to receive referrals for "at risk" women to a greater degree than any of the other hospitals, that more anxious women would be found in this class.

One final consideration was that perhaps the low correlation between attendance at antenatal classes and the prediction of anxiety during pregnancy was due to the poor quality of the courses available. Consequently, women were invited to comment on the particular course that they attended in light of the labour and delivery they experienced. The comments made by women (included in Appendix A) revealed that the majority of women who completed a Course Evaluation considered themselves to be adequately prepared for labour and delivery by the antenatal course they had attended. Many comments were made relating to aspects of the courses which could be improved but in all cases these comments were made by only a few women.

Summary

The main results of the present study were as follows: 1. Prediction of Anxiety. The analyses of the variables obtained from the BIQ revealed that no single variable was a substantial contributor to the prediction of anxiety. However, of those variables analyzed, the single best predictor was Comfort level (i.e., degree of financial security) followed by Tertiary Education

(i.e., the extent to which women had experienced tertiary education). These two variables were also among the best predictors of other anxiety-related measures including - Sleep Disturbance during Pregnancy, Fears for Self, Irritability and Tension, and Depression and Withdrawal. These analyses emphasized two important factors. Firstly, anxiety is very difficult to predict because of the many different environmental influences that have the capacity to precipitate anxiety. Secondly, it appears from the results that attendance at antenatal classes was not noticeably effective as a means of reducing anxiety at least for the women in the present study.

2. Contrast of Highly Anxious Women with Medium/ Low Anxious Women. Women who were highly anxious were more likely to have members of the family living in Christchurch, to be financially insecure, and were less likely to have experienced tertiary education than women in the medium/ low anxiety group. Women who were highly anxious were also twice as likely to have been pregnant, possibly pregnant, or to have had a child before this marriage than women in the medium/low anxiety group.

3. Exploratory Analyses. The analyses which incorporated Comfort level and Gravida Status as blocking factors revealed that Comfort level differentiated the subjects in terms of the anxiety-related measures more clearly than did Gravida Status. In many of the analyses, women in Comfort level 1 were affected more adversely than women in the other two comfort levels. While several

inter-group differences related to gravida status were obtained, no consistent trend was apparent.

The analyses in which Comfort level and Trimester were used as blocking factors showed similar trends, i.e., the majority of results revealed Comfort level 1 women to be significantly different from the other two comfort levels. The effects of Trimester were apparent mainly in the interactions but there was no immediately obvious trend attributable to trimester. This result indicates that although trimester of pregnancy per se was not a major influence in the maternal environment, it did have an effect when interacting with some of the psychological reactions to pregnancy and comfort level.

4. Marital Status. The results of the analysis (Tables 17 & 18) indicated that single women showed more adverse psychological reactions during the current pregnancy than married women.

5. Antenatal Class Attendance. The original hypotheses were not supported by the results obtained in the present study. i.e.,

(i) Women attending an antenatal class were not found to be less anxious than women who were not attending such a course.

(ii) Women who were not attending an antenatal class but had in the past, were not found to be less anxious than women who had never attended such a course.

It thus appears that for reasons not yet identified, antenatal class attendance may not have been an effective means of reducing anxiety levels in pregnant women, at least for the subjects of the present study.

CHAPTER FIVE

DISCUSSION

It would appear from the results obtained in the present study that attendance or nonattendance at antenatal classes is not a good predictor of level of anxiety in pregnant women. One suggestion has been made that perhaps the available courses have inherent shortcomings that reduce their effectiveness. If the aim of antenatal courses is to prepare women for labour and delivery, then results from the Course Evaluation questionnaire suggest that in general, Christchurch antenatal courses are fulfilling this function adequately. However, in view of the fact that many women are apparently experiencing adverse psychological reactions to their pregnancies, it seems important that such courses should perhaps, also be focussing on the needs of the women while they are pregnant, i.e., that the courses should be providing support and advice in such a way that women are able to make a better adjustment to the stresses of pregnancy itself. The present study has not investigated this aspect of antenatal courses and the possibility that courses are not providing adequate support in this area cannot be discounted.

Several other factors could also have reduced the apparent influence of antenatal courses on anxiety levels of women. Firstly, although subjects were obtained from

almost all of the medical centres in Christchurch, they represented only about 25 percent of the women who had babies in the city during the survey period. Although the geographical area of Christchurch seemed to be adequately represented, the researcher was entirely dependent on the medical staff of the centres to obtain the subjects. This means that there is no way of knowing how many women did not take part in the study, or what the characteristics of the non-participants were. There is also a large group of women who would attend one- or two-doctor medical practices, or alternatively, hospital antenatal clinics, who may not have been sampled by this study. A second difficulty encountered in the present study was that the women who are likely to be more anxious during pregnancy are also less likely to attend antenatal classes. If this is indeed the case, then it is not surprising that antenatal classes did not appear to be effective in reducing anxiety. In view of these difficulties, it seems necessary to look more carefully at the characteristics of women who show higher than usual levels of anxiety during pregnancy.

The present study has attempted to take into account a wide variety of factors operating within the immediate environment and the more extended environments of the subjects to gain an understanding of the influences that affect the emotional state of the subjects. Following Bronfenbrenner's (1977) arguments, it seemed important to incorporate data or aspects of the environment beyond the subjects' immediate environment as well as data

obtained from the immediate environment. Variables which were assumed to measure aspects of the immediate setting, i.e., the homes of subjects include - gravida status, age of the subject and of her husband (if she is married), age at which they married and the number and ages of children already in the family. Variables which were assumed to indicate influences on the subjects beyond their immediate environment include - whether or not parents are living, whether or not there are members of the family living in Christchurch, socio-economic status (husband's and wife's), attendance at antenatal classes, level of education attained, and whether or not the subject attended a tertiary institution. The results of the study have shown that two factors are the strongest predictors of anxiety, viz., Comfort level (i.e., degree of financial security), and Tertiary Education.

In the majority of analyses undertaken, the most anxious women were likely to be those who were in Comfort level 1 (financially insecure). It also appears that the most anxious women were less likely to have obtained a tertiary education than less anxious women. It thus seems that the most anxious women are likely to be less well educated than less anxious women and are also less likely to attend antenatal classes than less anxious women. This seems a rather disturbing finding in view of the strong beliefs held by medical practitioners - in Christchurch at least (initial discussions), in the desirability of women understanding the pregnancy and birth processes.

It would appear that the women who most need this knowledge, i.e., the more anxious women, are less likely to gain the knowledge because they are less well educated and are less likely to attend antenatal classes to gain the knowledge. It seems useful to consider the possible reasons why such women are less likely to attend antenatal classes. Firstly, it could be that because they are less well educated the classes may seem unappealing to these women. Alternatively, it could be that because they are financially insecure, the classes are actually physically inaccessible for reasons already discussed.

In the present study, many of the significant results have interactions between several variables and this has resulted in a complex description of the analyses. Some clarification of the situation is provided by the comparison between highly anxious women and those showing medium/low levels of anxiety. In this analysis, three variables gave significant results - Comfort score, Tertiary Education and Family in Locality. The indications are that highly anxious women are much less likely to have received tertiary education than medium/low anxious women, they are more likely to have members of their family living in Christchurch, and they are also more likely to be financially insecure than the medium/low anxious women. In addition, at the time of their marriage, highly anxious women were twice as likely as medium/low anxious women to be pregnant, possibly pregnant, or to have had a child previously. The question arises of

whether or not the highly anxious women "got themselves pregnant" so that they could force a marriage and therefore satisfy their need for a secure loving relationship. (The fact that they were more likely to have family members living in Christchurch raises the possibility that they could be more dependent on the family than other women in the sample.) The suggestion has been made earlier that women who have received tertiary education may have had to leave their family and home town in order to attend a tertiary institution and therefore may have become more independent and self-reliant. Since highly anxious women are less likely to have attended a tertiary institution, and are likely to be living in the same town as members of their family, it is possible that they have not achieved the same level of independence and self-reliance as less anxious women. Alternatively, it is possible that highly anxious women did not have access to contraceptives and once they found themselves pregnant, were "forced" into marriage because they believed that society at that time, was less accepting of ex-nuptial births. Such "forced" marriages could well precipitate high anxiety because the couples would probably not be ready for marriage, nor financially secure enough to begin raising children.

These possibilities all seem relevant for, during the past decade, attitudes toward extra-marital relationships and ex-nuptial births seem to have changed considerably. Information on contraceptive methods and family

planning have become much more widely available to single people, especially since the growth of the New Zealand Family Planning Association clinics has begun to take effect. Because these clinics maintain anonymity, it is often possible for single people to obtain information from them without the knowledge of their families whereas it may be more difficult to obtain the same help from the family doctor. The attitude of society seems to have changed considerably toward unmarried mothers to the extent that it is more acceptable for unmarried couples to live together, and if the pregnant woman decides not to continue the relationship with the baby's father, she can obtain the domestic purposes benefit from the Social Welfare Department.

The question which arises is whether or not the women from the highly anxious group would have become pregnant if they had been faced with the apparent circumstances existing currently, and if so, would they have chosen to marry? Assuming that all women had access to contraceptive advice, an analysis was made of questions 23, 44 and 51 of the PRQ (these indicate whether the baby was wanted at this time, and whether or not the woman tried not to become pregnant). It was apparent that 51 women (19.7 percent of the total sample) did not want the baby at this time, and of these women, 48 had tried not to become pregnant. Of the women who did not want the baby at this time, 29 stated that the pregnancy was unwelcome because of money problems, housing problems, or because

they considered they had enough children already. It seems therefore, that a sizeable proportion of women in this study (almost 1 in 5) were facing an unwanted pregnancy and that most of these women had tried to prevent themselves from becoming pregnant. This is not a problem confined to single women either since of the women who did not want the baby at this time, 36 were married. Preliminary results from the Christchurch Child Development Study (1978) have indicated that the majority of women who experienced an unwanted pregnancy, welcomed the baby once it was born. Even if this finding characterizes the women in the present study, the possibility cannot be ruled out that an unwanted pregnancy may still be a very stressful event.

It would appear that several aspects of the immediate home environments of the women (family income, number of children already in the family, physical conditions of housing, etc.) in conjunction with changes in the macrosystem (especially the economic situation of the country as a whole) are reflected in feelings of financial insecurity for many women and increased anxiety during the pregnancy.

As previously mentioned, many studies have used gravida status as a means of categorizing pregnant women. The assumption has usually been made that pregnant women having their first child are in a significantly different situation from those experiencing second or subsequent pregnancies. Most frequently, the comparisons undertaken

have been either primigravidae versus multigravidae, or primiparae versus multiparae. In the present study a comparison was made between primigravidae, duigravidae and multigravidae. While anxiety during pregnancy did not differentiate these groups, several other psychological reactions which were also examined, provided interesting intergroup (gravida status) differences.

Analyses were made of desire for pregnancy scores using gravida status and comfort levels as blocking factors. The results indicated that within Comfort level 1 (financially insecure), duigravidae (i.e., women experiencing their second pregnancy) wanted the baby significantly more than either primigravidae or multigravidae. It would seem logical that women who were financially insecure would not want to increase their family size whilst in this situation - an assumption which was borne out by the significant difference between multigravidae and duigravidae. At the same time, following this line of reasoning, it would also seem logical that duigravidae would have less desire for this pregnancy than primigravidae. This was not the case however. Duigravidae who were financially insecure wanted the present baby significantly more than primigravidae who were financially insecure. There could be at least two explanations for this result. Firstly, a second child is often desired to balance the structure of the family - to provide company for the first child and also hopefully, to produce a child of the opposite sex to the first child in the family.

Secondly, the primigravidae included all but two of the single women and this could have inflated the score for desire for pregnancy for primigravidae. Within Comfort level 3 (financially very secure), multigravidae showed significantly less desire for pregnancy than women in either of the other two gravida groups. This could indicate that women who are very secure financially prefer to have smaller families for a variety of reasons. It may be that larger families restrict their ability to be independent, or perhaps they are more aware of the moral implications of having larger families in times of dwindling world resources. It is not clear however, whether there is an educational factor involved or whether women who are financially very secure are more aware of the additional costs generated by having a third or subsequent baby.

It is also interesting to note the results for the analysis of nausea scores and comfort level. It will be remembered that the findings for various research projects on nausea produced conflicting results. Many authorities regard nausea as a natural concomitant of pregnancy whilst others regard it as an indication of rejection of pregnancy or an indication of ambivalence toward pregnancy. Wolkind and Zajicek (1977) found in their review of the research that prolonged vomiting is associated with high levels of stress due to physical and social difficulties. The results of the present study indicated that women who were financially insecure reported significantly more feelings of

nausea than women who were financially secure and women who were financially very secure. Several factors could account for this result. Firstly, since financially insecure women desired the present pregnancy less than other women, the nausea could be an indication of unconscious (or conscious) rejection of the pregnancy. Secondly, the nausea could be an indication of ambivalence toward this pregnancy, i.e., financially insecure women could have strong maternal feelings but at the same time know they simply cannot afford the financial strain of another child. This latter possibility seems less likely than the first suggestion because the results for maternal feelings did not indicate significant differences between the three gravida groups. However, the combination of strong maternal feelings and financial insecurity could result in greater ambivalence than would result from a combination of equally strong maternal feelings and financial security. It also seems probable that it would be the interaction of the two environmental influences rather than the influence of either single factor which would be responsible for the ambivalence. A third explanation also seems tenable. It was found that financially insecure women were significantly more irritable and tense, and more depressed and withdrawn than women in the other two comfort levels, and their higher nausea scores could reflect greater emotional stress resulting from their financial insecurity. Wolkind and Zajicek's (1977) conclusions that prolonged vomiting is associated with high

levels of stress precipitated by physical and social difficulties thus seem applicable to the present study. Although nausea and vomiting (as measured in the present study) were not necessarily prolonged. it seems likely that they were more than just normal manifestations of pregnancy - i.e., that they were further reflections of the interaction between the financial status of the mothers and their psychological reactions to the pregnancy.

The analysis of fears for self (with Comfort level and Trimester of pregnancy as blocking factors) yielded an interesting interaction (Figure 9). For comfort levels 2 and 3, the level of fears for self remained approximately the same across trimesters. However, for comfort level 1 women, the level of fears for self was significantly lower than was the case for women in the other two comfort levels during the first trimester. Moreover, these fears increased throughout pregnancy so that during the third trimester, comfort level 1 women (financially insecure) were significantly more afraid than comfort level 3 and more afraid than comfort level 2 women. This result raises three possibilities. Firstly, as comfort level 1 women are less likely to attend antenatal classes, it may be the case that they had not gained the necessary information and training to deal calmly with the prospect of labour and delivery and that they perceived the coming event as very painful and one over which they had little control. Secondly, as pregnancy progressed, comfort level 1 women may have become increasingly aware of the added

burden the baby would be to their already overburdened financial resources. A third possibility is that the low level of fears for self during the first trimester on the part of comfort level 1 women may have been an unconscious denial of the fact that they were afraid - a fact which became impossible to deny as pregnancy progressed.

Several interesting results were obtained from the analysis of fears for baby (Figure 10). The level of fears held by comfort level 1 women were similar to those in the analysis of fears for self (Figure 9) and the same three possibilities could be applied to this result. Comfort level 2 women showed a slight decrease in the level of fears held for the baby during the second trimester when compared with the other two groups, but this result was not significant. However, it is very puzzling that women in comfort level 2 should have such high levels of fears for the baby during the first trimester in comparison with the other two groups. It is noticeable that there were very few subjects in the first trimester of pregnancy in the total sample - thus yielding a comparatively unreliable estimate especially when divided into three comfort levels. The reason for the result obtained for comfort level 3 women seems rather obscure and could possibly be related to the pattern of nausea during pregnancy. Apparently, women often experience nausea during the first four or five months of pregnancy, and after this time the nausea tends to diminish. In such a case, it may

be that the fears held by comfort level 3 women for their babies were a direct consequence of the occurrence of nausea and vomiting. Once the sickness began to diminish, so too did their fears for the baby. The fears for the baby may also have declined as a result of knowledge gained from antenatal classes attended, especially since few women begin attending such classes before the fourth or fifth month of pregnancy (i.e., during the second trimester).

The present results failed to support the contention that attendance at antenatal classes would be associated with lower anxiety levels in pregnant women. The influence of socio-economic factors on the anxiety levels of pregnant women and on their attendance at antenatal classes, however, was found to be substantial. Women in comfort level 1 (financially insecure) were being strongly affected by their financial status and were less adequately prepared for pregnancy resulting in stronger adverse psychological reactions to the pregnancy. In contrast to this, women who were financially secure and especially those who were "very well off" did not have to be so concerned with the financial impact of the impending addition to the family and were consequently more aware of, and more affected by, the actual developmental process of the pregnancy itself. Their over-all adjustment was more influenced by nausea and vomiting and the early discomfort of pregnancy, and once this had subsided, they were able to cope with pregnancy and apply the

knowledge that they had gained from attending classes. In terms of Bronfenbrenner's (1977) position, attendance at antenatal classes was only one influence from a variety of influences occurring within the external environments of the pregnant women. Because the women in comfort level 1 were experiencing a very different environment from that experienced by comfort level 2 and 3 women, their reactions during pregnancy were also very different. The adverse psychological reactions of comfort level 1 women thus appeared to be related to the adverse circumstances they were experiencing in their extended environments - circumstances which probably could not be influenced or ameliorated by attendance at antenatal classes.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

The present study was essentially exploratory in nature and had two major objectives. Firstly, the study endeavoured to determine whether or not attendance or non-attendance at antenatal classes had a discernible influence on anxiety levels in pregnant women. A second objective of the study was to ascertain the influences in the environment which affect anxiety levels in pregnant women. The subjects were 258 women ranging from 6 weeks pregnant to 40 weeks pregnant, and included primi-, dui- and multigravidae, married and single women. All women were required to complete a series of questionnaires whilst they were pregnant, and women who had attended antenatal classes were also requested to complete an evaluation of the particular course they attended after the birth of the baby.

The results indicated that although attendance or non-attendance at antenatal classes did make a significant contribution to the prediction of maternal anxiety during pregnancy, the proportion of variance accounted for by this variable was in fact very small. Moreover, no significant differences in anxiety levels were apparent between women who were attending or had attended antenatal classes in the past, and women who were not and never had attended such classes. Consequently, although there were

significant differences in levels of anxiety between different groups of women in the present study, attendance or non-attendance at an antenatal course was not a salient factor in such differences.

A variety of factors were shown to be characteristic of highly anxious women when compared with medium/low anxious women. The factors which characterized highly anxious women included a smaller likelihood of having a tertiary education, an increased likelihood of having family members living in Christchurch, and an increased likelihood of being pregnant, possibly pregnant, or to have had a previous child at the time of this marriage. Since less anxious women were less likely to have had family members living in Christchurch and more likely to have received tertiary education than highly anxious women, it is possible that they would be more likely than highly anxious women to seek information about pregnancy from independent sources such as books and educational institutions rather than from mothers, sisters and other family members. Although the information offered by family members may well be derived from reputable sources and based on experience, it seems likely that such advice would be "coloured" to some extent by past experience and more biased than information gained from independent sources. A study of the types of information passed on to pregnant women by friends and relatives, and an examination of the extent to which such information affects the expectations of

pregnant women, would be valuable for future research.

A further question which was also considered in the present study was whether or not there were any specific influences occurring during pregnancy which yielded higher levels of anxiety than would normally be expected. A wide variety of factors were included in an attempt to identify the extent of adverse circumstances operating within the maternal environments. These included: medical centre attended, subject's doctor, marital status, gravidity, age, husband's age, age at marriage, husband's occupational status, wife's occupational status, number of children already in the family, ages of children, number of miscarriages already experienced, degree of family support, and degree of support from friends. None of these factors per se, was a sizeable predictor of anxiety in pregnant women.

The set of circumstances which appeared to produce the most adverse effects in the maternal environment was that which led to financial insecurity. Comfort level (degree of financial security) was in fact, a better predictor of anxiety in pregnant women than any other variable which was examined followed by Tertiary Education (extent to which women experienced tertiary education). It seems likely however, that receipt of tertiary education was to a considerable extent an indicator of financial security. The fact that a woman had received tertiary education could indicate that she came from a family that had been sufficiently secure financially to allow her to

participate in this type of education.(The correlation actually obtained between Comfort level and Tertiary Education was not significant (R = 0.067)). The receipt of tertiary education could also be an indication of greater independence, wider knowledge, and perhaps higher levels of intelligence.

The present results indicate that women who are financially insecure not only appear to be more anxious than other pregnant women but also suffer from more sleep disturbance, more nausea and vomiting, are more irritable and tense, and experience more depression and withdrawal, than do women who are financially secure (or very secure). It is also quite possible that these various psychological reactions are interrelated, i.e., loss of sleep may cause increased irritability and tension; vomiting and nausea may cause increased depression and withdrawal; increased vomiting and nausea may be caused by increased anxiety and tension. At the same time, it is certain that women who are experiencing such increased levels of these reactions will find it more difficult to cope with their pregnancy than women who are psychologically and physically more settled. A considerable body of research evidence indicates that pregnancies which are beset by such problems can place the baby 'at risk' with increased probability of retarded or abnormal development.

Limitations of the Present Study

The most severe problem for this study was the lack

of control the researcher had over the selection of subjects and the fact that once obtained, the subjects could not be randomly assigned to experimental and control groups. As discussed previously, all but two of the doctors approached actively encourage women to attend antenatal classes because they believe the preparation is important and therefore it was simply not possible to assign women to a particular group. It would have been desirable to be able to assign women to the group to attend antenatal classes or in a group which would not attend such classes but this could not be done. The procedure followed for the present study was that doctors and practice nurses invited women to participate and they were then categorized into groups resulting in an "ex post facto design" (Neale & Liebert, 1973). Such a research design has inherent weaknesses in that it cannot control for the influence of additional variables that may or may not be related to the dependent variables. This weakness has been emphasized in the present study by the fact that women who elected to attend antenatal classes had certain characteristics which made them significantly different from women who elected not to attend classes and these characteristics may have reduced the effectiveness of antenatal classes in reducing anxiety levels.

A second major problem was that because of the limited time available, it was not possible to undertake a longitudinal study which could have tested the reactions of women at various stages throughout their pregnancies.

The present study is cross-sectional and has grouped the women according to trimester. There may actually be real differences between trimester groups which are confounded with stage of pregnancy and 'history' since conception, which could have masked the effect of other variables. A longitudinal study could have clarified this issue by following the progress of women throughout the various stages of pregnancy.

A third problem was that no measure was taken before the subjects became pregnant to determine anxiety levels prior to pregnancy. The PRQ did include a scale to estimate the level of anxiety before pregnancy but since the questions had to be answered retrospectively, the reliability (and validity) of this measure seemed suspect and these scores were not used in the present study. If it had been possible to question the women before they became pregnant, a baseline would have been available from which increases in anxiety due to pregnancy could have been calculated. Such comparisons could have provided a distinction between trait anxiety and state anxiety, i.e., women who normally tend to be anxious compared with women whose anxiety seems to be due specifically to pregnancy. If such a distinction could have been made, it may have been possible to gain a clearer impression of the ability of antenatal classes to relieve anxiety in pregnant women.

The problem also arises that perhaps antenatal classes are not effective in reducing anxiety because

they are not appropriately taught. Although details were obtained of the content of the courses, no observations were made of the way the information was disseminated. It may be the case that some course administrators are placing greater emphasis on the practicalities of teaching exercises and imparting factual information about pregnancy and labour rather than attending to the psychological and emotional needs of pregnant women.

There were also difficulties caused by the unreliability of some medical staff members in requesting women to participate. During the first two weeks, some of the medical staff forgot to ask women to participate so that if those women did not have another appointment within a month, they would not have been asked to participate. Another difficulty arose because one or two practices asked only women in the later stages of pregnancy to participate so that there were small numbers of women included in the study who were in the first trimester of pregnancy.

Although the sample of women for this study included 258, it is known that this may have represented as few as 25 percent of the total number of pregnant women in Christchurch during the survey period. It is therefore impossible to determine whether or not the sample was actually a representative cross-section of pregnant women at that time.

It is also possible that the measures used were not sensitive enough to detect accurately influences on

anxiety. There may have been other variables at work that were not included in the analyses undertaken.

Implications of this study for the reduction of mental handicap and developmental retardation.

Women who are financially insecure also face the possibility of having to restrict the types of food that they are able to buy because of steadily increasing inflation in the national economy, and may also be facing difficulties in adequately clothing and housing themselves and their family. All of these factors detract from the optimal conditions desirable for the normal development of the baby, and may adversely affect prenatal development. Consequently, it would appear that women who are financially insecure need additional assistance in coping with pregnancy, i.e., financial help and moral support. Antenatal classes can offer moral support and knowledge about pregnancy and the birth process but unfortunately, their ability to assist financially insecure women is presently limited in that such women are less likely to attend classes than women who are financially secure. Moreover, the possibility cannot be discounted that because financially insecure women are less well educated as a group than financially secure women, they may possess less factual knowledge about pregnancy and the birth process.

It was also apparent from this study that most

of the comprehensive antenatal courses (i.e., those providing both lectures and physiotherapy classes) were not readily accessible to women in all parts of Christchurch. The courses tended to be held in the central part of the city or in a suburb which was not readily accessible to people from other areas of the city. It would seem therefore, that if women are to gain the maximum benefit from antenatal classes, the classes must be decentralized and some at least, located in the suburbs where women who have transport problems can attend more easily. It would also seem desirable that crèche facilities be made available for those women who are unable to arrange babysitters for their other children.

It may also be possible that women who are financially insecure may need supplementary dietary help such as that provided by the government in Britain and discussed previously. For these women, under-nutrition of the foetus could be a very real risk especially since they appear to suffer significantly more nausea and vomiting during pregnancy than women who are financially secure.

As New Zealand appears to be sliding further into economic recession, problems such as those mentioned above will almost certainly become even more accentuated for financially insecure women. Abortion on demand would be suggested by some as a remedy, but many women who find themselves pregnant in such adverse circumstances would not want to have an abortion. A more positive solution

would be to have better support systems readily available to women during pregnancy and during the early developmental period following birth. Without such support systems, it is highly likely that during the next few years, New Zealand will find increasing numbers of children experiencing learning and behaviour difficulties at school due to delayed or restricted development and difficult home circumstances. At present there is no indication that the economic climate of this country is likely to improve rapidly and therefore in the forseeable future, it is likely that increasing numbers of pregnant women will be placed in positions of financial insecurity, and consequently, could be placed 'at risk' during pregnancy. If such a situation does arise, there could be increasing numbers of children experiencing learning difficulties due to early developmental retardation, and it is doubtful whether the limited facilities available to such children within the present education system would be sufficient to cope with the increased need for assistance. The most useful solution, and probably the cheapest solution in the long run, would be to increase the support services (eg. child care facilities, nutritional supplements, financial help, etc.) available to women during pregnancy and the early developmental period of their children.

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APPENDICES

APPENDIX A

Summary of the results of the Antenatal Course Evaluation.

Table 21

Antenatal Course Evaluation

Evaluation forms were sent to 150 women who had indicated that they were attending antenatal courses or intended to do so later in their pregnancies. Of these, 73 women returned the form completed, while a further 23 who subequently had decided not to attend an antenatal course returned the form uncompleted.

Results for questions 1, 4 and 5 are summarized in Table 21 and indicated that the majority of the women (93.15 percent) had found the course that they attended to be adequate in length. All women believed that they were able to understand the content of the lectures given, and the majority (82.19 percent) were able to ask questions about things they did not understand, or were not discussed. However, a sizeable group (10.96 percent) felt that they were able to ask questions only occasionally. Unfortunately, it is not known whether this was the case because these women were too shy to ask questions or because they were not permitted to do so.

A total of 35.62 percent of the women stated that there were topics that they would have liked to have spent more time on at the course they attended and these included the following: Breast-feeding; the adjustment necessary in the husband-wife relationship with the addition of a baby to the family; basic care of the baby at home; and how to cope with colic, sickness and other problems; child development in the first few months; and childbirth in the home. There were also topics to do with actual hospital practice including: The use of drugs during delivery and what effects they have on the patient; induction; what the actual labour is going to be like; husband participation; hospital routines on entry to the hospital, eg., preparation for labour; and problems which could arise during delivery.

Perhaps the most important aspect of this antenatal course evaluation was the question relating to whether the women felt that there was any part of labour and delivery for which they had not been prepared by their particular course. Thirty-one women (42.47 percent) said that there were aspects of the experience for which they had not been adequately prepared. The comments made by the women

include the following:

- Seven women commented that there had been no discussion of the problems that may be encountered during delivery and they felt they had been completely unprepared for the difficulties that they experienced.
- Four women were not prepared for induction and felt that there should have been discussion of this procedure.
- Five women commented on the effects or lack of effects that medication had had on them, especially in relation to anaesthesia, and 'pain-killers' that did not work.
- Four women made comments about special breathing techniques taught to them for use during delivery. They felt that knowledge of these techniques was very necessary and that husbands should learn them as well as their wives. It was suggested that it would be advantageous if one or two practical sessions were devoted to the learning of these techniques during the lecture course.
- Three women stated that at various times during delivery they had not known what was happening to them and that this had been worrying to them.
- Two women had been upset by the impersonal treatment they had experienced during delivery.
- Three women had been happily surprised by the brevity of their labour.
- One woman was not prepared for a twin labour and delivery, and finally,
- One woman commented that she and her husband had not realized that the baby's head was malleable at birth. She said, "My husband thought he had a brain-damaged baby when he observed that the nurse could squeeze the head like marshmallow."

In the final section of the antenatal course evaluation form, the women were invited to make any further comments they wished and many responded to the invitation. A number of comments overlapped considerably with those made in the previous section:

- Three women thought that there should have been more emphasis on preparing husbands who wanted to attend the delivery. They

noted that husbands could be very supportive if they knew how to help their wives, and noticeably (and unhelpfully) nervous if they had not had adequate preparation.

- Four women commented that it was difficult to realize before birth just how much impact the new baby made on the relationship between husband and wife, and that their own roles had changed considerably. They felt that husbands as well as wives needed to be prepared in advance for the emotional and physical demands that would be made on them by the addition to the family. In connection with this, it was felt that information on parenthood and alternative styles of parenting would be valuable.
- Four women found the physiotherapy to have been the most valuable part of the course and would have preferred to have spent more time on this - preferably continuing right up until delivery so that there was complete familiarity with the procedures. At the same time, three other women commented that the course they had attended had been mainly concerned with exercises and the management of labour and that there was a definite need for information about other aspects of delivery such as hospital routines etc.
- Two women found the course they had attended to have been "low key" and adequate for a second pregnancy but of indifferent depth for a first pregnancy.
- Two women commented on the lack of information given about problems and abnormalities that can arise during labour, and that some knowledge of these would have been helpful.
- Three women commented about the usefulness of films especially of delivery - that to be of real value, they should be up-to-date and relevant to conditions in New Zealand.
- Two women raised the topic of breast-feeding again. This was covered in the course they had attended but only as the desirable way to feed. They felt that too much emphasis had been given to this, and that as a result it had been unnecessarily difficult for women who later had problems with breast-feeding. These women believed that the importance of feeding with tenderness had been lost sight of in the discussion of whether to

breast-feed or not.

- Four women emphasized the need for information about mother-craft, babycare and how to cope with problems with the baby. The suggestion was made that it would have been very reassuring and helpful if there was a 'life-line' type of organization that mothers could ring at any hour of the day or night when they needed information about a particular difficulty.
- The comment was also made that if the antenatal class was too large, it became difficult for some women to relax and gain maximum benefit from the instruction.
- Finally, five women were full of praise for the courses they had attended. They believed that the courses had been very informative, conducted by friendly, helpful staff, and that these courses should be made compulsory for all pregnant women.

In conclusion, it appears that the majority of women were, on the whole, satisfied with the particular courses that they had attended. It appears that the majority of these women felt themselves to be adequately prepared for most aspects of the labour and delivery experience. The additional comments made above have arisen probably because it must be very difficult for the authorities involved to cover every possibility that may arise during delivery with so many women. The three main criticisms seem to be - a) inadequate preparation of husbands who want to attend the delivery; b) lack of preparation for problems and difficulties that can arise during labour and delivery; and c) lack of preparation for care of the baby at home, and for the impact it makes on the lifestyle of the new parents.

Table 21

Percentages of Women making Particular Responses to Questions 1, 4 and 5 of the Antenatal Course Evaluation Questionnaire

Question		Percentage of Ss
1. What is your opinion of the length of the course?	Too long	4.11
	Adequate	93.15
	Too short	2.74
4. Could you understand all the lectures?	Yes	100.00
	No	0.00
5. Did you feel that you were able to ask questions about the things that puzzled you, or that were not discussed?	Always } Usually }	82.19
	Sometimes	0.00
	Occasionally	10.96
	Never	0.00
	Unspecified	6.85

APPENDIX B

Questionnaires including - Background Information Questionnaire (BIQ), Pregnancy Research Questionnaire (PRQ), and Antenatal Course Evaluation.

Table 22

University of Canterbury Christchurch 1 New Zealand

With the cooperation of the Canterbury Faculty of the New Zealand College of General Practitioners.

BACKGROUND INFORMATION

Patient No. _____ Medical Centre _____
Hospital No. _____ Doctor _____
Course No. _____

(Please read carefully before answering any questions).

We are studying the experiences of women during pregnancy...what they think, how they feel, and their health problems. In order to give women more help with the problems they may have during pregnancy, we need to know more about this important time in a woman's life. What you tell us will increase our understanding of the problems of the pregnant woman.

We would like you to fill in the attached questionnaire but before you do, we need some background information. You will notice that you have been given a code number. This is to ensure that your replies remain anonymous. Please accept our assurance that the strictest confidentiality will be maintained.

Thank you for your cooperation in assisting us with this research.

oooOOOOOooo

1. Are you going to a specialist or consultant obstetrician as well as your general practitioner? Yes/No

2. Are you attending an antenatal course? Yes/No
   (If so) Are you attending the physiotherapy classes? Yes/No
   Are you attending the lectures? Yes/No
   (If not) Do you intend to go to an antenatal course? Yes/No
   Have you attended an antenatal course in the past? Yes/No

3. For follow-up group only-
   Did you attend an antenatal course? Yes/No
   (If so) Did you attend the lectures? Yes/No
   How many?
   Did you attend the physiotherapy sessions? Yes/No
   How many?
   (If not) Is there any particular reason why you decided not to go?

4. Age _____ Husband's Age _____ Age at marriage _____
   If you are single do you intend to keep your baby? Yes/No

5. Education level attained. (Place X over level)
   F1, F2, F3, F4, F5, F6, F7. Tertiary education (state type) _____

6. Occupation _____ Husband's Occupation _____

7. Have you worked during this pregnancy? Yes/No
   For how long? (No. of mths) _____

8. Ages and sex of your children.

Age	Sex	Age	Sex
___	___	___	___
___	___	___	___
___	___	___	___

9. Have you had any miscarriages? Yes/No
   At what month of the pregnancy? _____
   _____
   _____

10. For how many months have you been pregnant? _____
    When is your baby due? _____

11. How many sisters have you? _____
    How many brothers have you? _____
    Is either of your parents still alive? Yes/No
    Which? _____

12. Do any of your family live in Christchurch? Yes/No
    Which of these categories would best describe your relationship with your family?
    Very good _____
    Good _____
    Poor _____
    Very poor _____

13. Which or your family live in Christchurch?(List them below) — On the average, how often would you see each of them?
    _____ _____
    _____ _____
    _____ _____
    _____ _____

14. Which of your husband's family live in Christchurch? (List) — On the average, how often would you see each of them?
    _____ _____
    _____ _____
    _____ _____
    _____ _____

15. Do you have any close friends in Christchurch who are able to be like a family to you? Yes/No

16. Are any of your friends pregnant at the moment? Yes/No
    (If so) Do you see them often? Yes/No
    Do you find it helpful to see them? Yes/No
    In what way? _____

SECTION I of Pregnancy Research Questionnaire

No._____

How has your health been during this pregnancy? (Circle)

Excellent Good Fair Poor Very Poor

Please report below the health problems you have had during this pregnancy. Read each of the questions and then report whether you have had each problem:

O	S	R	N
Often	Sometimes	Rarely	Never

Report how often you have each problem by drawing a circle around the "O" if you have the problem often, around the "S" if you have the problem sometimes, around the "R" if you have the problem rarely, and around the "N" if you never have the problem.

Health Problems During This Pregnancy

O S R N 1. Do you have trouble getting to sleep or staying asleep?

O S R N 2. Are you troubled by headaches?

O S R N 3. Do you have pressure or pains in the head?

O S R N 4. Do you have loss of appetite?

O S R N 5. How often are you bothered by having an upset stomach?

O S R N 6. Are you tired when you get up in the morning?

O S R N 7. Has any ill health affected the amount of work you do?

O S R N 8. Have you ever been bothered by shortness of breath when you were not exercising or working hard?

O S R N 9. Have you ever had dizzy spells?

O S R N 10. Have you ever been bothered by your heart beating hard?

O S R N 11. Are you bothered by dreams that frighten you or upset you very much?

O S R N 12. Do you tend to gain much weight?

O S R N 13. Do you lose weight when upset?

O S R N 14. Do you find that you are unable to put on weight?

O S R N 15. Are you bothered by sweaty hands?

O S R N 16. Do you bite your fingernails?

O S R N 17. Have you had fainting spells?

O S R N 18. Are you ever bothered by trembling hands?

O S R N 19. Do you suffer from backaches?

O S R N 20. Are you roubled by nausea or morning sickness?

O S R N 21. Have you had trouble with constipation?

O S R N 22. Have you had difficulty with swollen feet or legs?

O S R N 23. Are you bothered by muscle cramps?

O S R N 24. Are you troubled with vomiting?

O S R N 25. Do you perspire a great deal?

O S R N 26. Do you get very hungry?

O S R N 27. Do you urinate frequently?

O S R N 28. Do you get chills?

O S R N 29. Do you feel hot and flushed?

O S R N 30. Do you get heartburn?

O S R N 31. Are you bothered by diarrhea?

O S R N 32. Do you ever feel weak?

O S R N 33. Do you tire easily?

O S R N 34. Are you bothered by dry skin or rashes?

O S R N 35. Do you crave certain foods?

O S R N 36. Do certain foods bother you since pregnancy?

O S R N 37. Do your hands or feet tend to feel cold?

O S R N 38. Are you bothered by dry mouth, bad breath or bad taste in your mouth?

O S R N 39. Have you had difficulty with spotting or bleeding?

O S R N 40. Do you ever have trouble breathing?

O S R N 41. Do you smoke heavily?

O S R N 42. Do you have asthmatic attacks?

O S R N 43. Do you have allergies?

O S R N 44. Do you have ulcer attacks?

O S R N 45. Do you ever feel that you are going to have a nervous breakdown?

46. Have you had any other problems during this pregnancy?

Yes_____ No____ (If so, please list problems)

Now report the health problems you have had <u>before this pregnancy</u>. Do <u>not</u> include any problems you may have had during this or other pregnancies.

<u>Health Problems Before This Pregnancy</u>

O S R N 1. Did you ever have trouble getting to sleep or staying asleep?

O S R N 2. Were you troubled by headaches?

O S R N 3. Did you ever have pressure or pains in the head?

O S R N 4. Did you have loss of appetite?

O S R N 5. How often were you bothered by having an upset stomach?

O S R N 6. Were you tired when you got up in the morning?

O S R N 7. Has any ill-health affected the amount of work you did?

O S R N 8. Have you ever been bothered by shortness of breath when you were not exercising or working hard?

O S R N 9. Have you ever had dizzy spells?

O S R N 10. Have you ever been bothered by your heart beating hard?

O S R N 11. Were you ever bothered by dreams that frightened you or upset you very much?

O S R N 12. Did you tend to gain too much weight?

O S R N 13. Did you lose weight when upset?

O S R N 14. Did you find that you were unable to put on weight?

O S R N 15. Were you bothered by sweaty hands?

O S R N 16. Did you bite your fingernails?

O S R N 17. Have you had fainting spells?

O S R N 18. Were you ever bothered by trembling hands?

O S R N 19. Did you suffer from backache?

O S R N 20. Were you troubled by nausea?

O S R N 21. Have you had trouble with constipation?

O S R N 22. Have you had difficulty with swollen feet or legs?

O S R N 23. Were you bothered by muscle cramps?

O S R N 24. Were you troubled by vomiting?

O S R N 25. Did you perspire a great deal?

O S R N 26. Did you urinate frequently?

O S R N 27. Did you get the chills?

O S R N 28. Did you feel hot and flushed?

O S R N 29. Did you get the heartburn?

O S R N 30. Were you bothered by diarrhea?

O S R N 31. Did you ever feel weak?

O S R N 32. Did you tire easily?

O S R N 33. Were you bothered by skin rashes?

O S R N 34. Did your hands or feet tend to feel cold?

O S R N 35. Were you bothered by dry mouth, bad breath or bad taste in your mouth?

O S R N 36. Did you ever have trouble breathing?

O S R N 37. Did you smoke heavily?

O S R N 38. Did you have asthmatic attacks?

O S R N 39. Did you have allergies?

O S R N 40. Did you ever have ulcer attacks?

O S R N 41. Did you ever feel that you were going to have a nervous breakdown?

O S R N 42. Did you have any other health problems before this pregnancy?

Yes_____ No_____

Many women find that around the beginning of menstruation they feel sick or miserable in various ways. Please report below, the problems you have had during your periods. Answer the questions in the same way that you answered the last section, by drawing a circle around the letter that best describes your experience.

O S R N 1. Did you feel tired?

O S R N 2. Were you bothered by headaches?

O S R N 3. Did you have an upset stomach?

O S R N 4. Were you ever troubled by diarrhea?

O S R N 5. Did you get aches and pains?

O S R N 6. Did you feel jittery?

O S R N 7. Were you bothered by dizziness?

O S R N 8. Did you find that you could not relax?

O S R N 9. Were you bothered by backaches?

O S R N 10. Did you feel tense?

O S R N 11. Did you become irritable?

O S R N 12. Did you have trouble getting to sleep or staying asleep?

O S R N 13. Did you feel weak?

O S R N 14. Did you find that you were unable to work?

O S R N 15. Did you ever feel like crying?

O S R N 16. Were you bothered by loss of appetite?

O S R N 17. Were you troubled by a feeling of sadness and depression?

oooOOOOOooo

SECTION II of Pregnancy Research Questionnaire

No._____

In the following questions, we would like to know about some of your feelings about pregnancy and labour. It is important that you answer all questions. After each statement, please check the answer that best describes your feelings. There are no right or wrong answers; we only want to find what the experineces of women are.

1. Most women go through labour without much difficulty.
   Strongly agree___ Mildly agree___Mildly disagree___Strongly disagree___
2. Before pregnancy, I had been looking forward to having a baby.
   Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___
3. I would like to have my mother or some older woman to help me take care of my baby.
   Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___
4. Some people think it's silly to have superstitions during pregnancy, but I find that I have them.
   Often___Occasionally___Rarely___Never___
5. I'm easily upset since pregnancy.
   Frequently___Occasionally___Rarely___Never___
6. I would like to have:
   1 child___2children___3 children___4 children___5 children___
   6 children___ more than six children___.
7. I've lost interest in things during pregnancy.
   Very much___Somewhat___A little___Not at all___.
8. If she would only admit it, every pregnant woman is scared and worried.
   Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.
9. When I first found out that I was pregnant, I was:
   Delighted___Happy___Just accepted it - was neither happy nor unhappy___Somewhat unhappy___Extremely unhappy___.
10. Taking care of a small baby is something that no woman should be expected to do all by herself.
    Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.
11. The baby can be harmed if the mother gets upset during pregnancy.
    Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.
12. I have felt my pregnancy is long and tiresome.
    Frequently___Occasionally___Rarely___Never___.
13. I stopped playing with dolls when I was:
    6 years or less___7 or 8 years old___9 or 10 years old___11 or 12 years old___13 years or more___.
14. Since becoming pregnant, I've been discouraged.
    Very much___Somewhat___A little___Not at all___.
15. I worry about having a great deal of pain during childbirth.
    Frequently___Occasionally___Rarely___Never___.

16. I would like to have:
A boy___A girl___It makes no difference___.

17. It's unpleasant to be alone when pregnant.
Strongly agree___ Mildly agree___ Mildly disagree___ Strongly disagree___.

18. I am afraid that my baby may be ugly or unattractive.
Frequently___ Occasionally___Rarely___ Never___.

19. I've been less patient with family and friends during pregnancy.
Very much___ Somewhat___A little___Not at all___.

20. I would consider my motherly feelings as:
Very motherly___Above average___Average___ Less than average___ Not motherly___.

21. I have been happy and cheerful during pregnancy.
Frequently___Occasionally___Rarely___Never___.

22. Any pregnant woman dreads delivery.
Strongly agree___Mildly agree___Mildly disagree___ Strongly disagree___.

23. I did not want to have a baby at this time.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

24. It would be comforting to know that you could turn to your mother or some older woman for help in making decisions.
Strongly agree___Mildly agree___ Mildly disagree___Strongly disagree___.

25. Any pregnant woman is concerned whether her baby will be normal.
Strongly agree___Mildly agree___ Mildly disagree___Strongly disagree___.

26. I've been more short-tempered since I've been pregnant.
Very much___ Somewhat___A little___ Not at all___.

27. Before I was married, I hoped to have:
No children___1 child___2 children___3 children___ 4 children___ 5 children___6 children___more than six children___.

28. I don't like being with people during pregnancy.
Frequently___Occasionally___Rarely___Never___.

29. If I had the choice, while delivering the baby, I would prefer to be:
"Out"___, Awake, but have drugs that would ease the pain___, Completely awake and not use drugs___.

30. Before I became pregnant, we were hoping to have a baby.
Strongly agree___ Mildly agree___Mildly disagree___Strongly disagree___.

31. No matter how much a young mother knows, she still should have her mother or some older woman around.
Strongly agree___ Mildly agree___Mildly disagree___ Strongly disagree___.

32. I worry that I may lose my baby.
Frequently___Occasionally___ Rarely___Never___.

33. I've been hard to get along with during pregnancy.
Frequently___Occasionally___Rarely___Never___.

34. When I was a little girl:
I wanted to take care of babies and young children whenever possible___. I liked taking care of babies and young children sometimes___. I was indifferent about taking care of younger children___. I thought younger children were a nuisance___.

35. Since becoming pregnant, I've felt dull and indifferent.
Very much___Somewhat___A little___Not at all___.

36. I believe that most women make too much fuss about the difficulties of childbirth.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

37. I sometimes wish that I weren't going to have this baby.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

38. A pregnant woman needs lots of consideration from her family.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

39. I worry that my baby may be injured while being born.
Frequently___Occasionally___Rarely___Never___.

40. I've been tense and edgy since pregnancy.
Very much___Somewhat___A little___Not at all___.

41. I would like it best if my baby were with me in the hospital all the time.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

42. I've felt very calm and peaceful during pregnancy.
Very much___Somewhat___A little___Not at all___.

43. I worry that I'll have a hard time during delivery.
Frequently___Occasionally___Rarely___Never___.

44. I tried to keep from becoming pregnant.
True___False___.

45. There is nothing worse for a young mother than being alone while going through her first experience with a baby.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

46. I worry about my baby being weak or sickly.
Frequently___Occasionally___Rarely___Never___.

47. I've been restless and uneasy during pregnancy.
Very much___Somewhat___A little___Not at all___.

48. When you first began to menstruate, how did you feel about it? (Check one or more)
Proud___Pleased___Just accepted it___Unhappy___Frightened___ Angry or rebellious___Disgusted___.

49. Since becoming pregnant, I've been unhappy and in low spirits.
Very much___Somewhat___A little___Not at all___.

50. I worry that having a baby will make me less attractive.
Frequently___Occasionally___Rarely___Never___.

51. This was the wrong time for me to have a baby because of: (Check all reasons that apply to you). My health___Money problems___ Housing problems___I did not want to leave my work___My husband or family does not approve___I have enough children___I'm not ready to settle down___It interferes with other plans___None of the above___.

52. Most women need more time than they are given to rest up after having a baby.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

53. I have been worried that my baby may be born dead.
Frequently___Occasionally___Rarely___Never___.

54. I've felt cross since I've been pregnant.
Frequently___Occasionally___Rarely___Never___.

55. Whenever I see a pretty baby:
I wish for one of my own___I feel like taking it up in my arms___ I am interested, but just look___I am not interested___I think babies are a nuisance___.

56. I've just felt like doing nothing since pregnancy.
Frequently___Occasionally___Rarely___Never___.

57. I worry that pregnancy and childbirth will ruin my health.
Frequently___Occasionally___Rarely___Never___.

58. Any pregnant woman would like to have her mother near her.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

59. I worry that my baby may be mentally retarded.
Frequently___Occasionally___Rarely___Never___.

60. I've been moody during pregnancy.
Frequently___Occasionally___Rarely___Never___.

61. If I had a choice, I would like:
To have someone care for the baby for me___To have someone care for the baby most of the time___To have someone care for the baby a lot of the time___To have someone care for the baby sometimes___To take care of the baby all by myself___.

62. Since becoming pregnant, I've been miserable.
Frequently___Occasionally___Rarely___Never___.

63. It's natural for a woman to worry that she might die during childbirth.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

64. Women should have more help with the job of raising children.
Strongly agree___Mildly agree___Mildly disagree___Strongly disagree___.

65. A woman should be careful about what she does during pregnancy for fear the baby may be hurt.
Strongly agree___Mildly agree___MIldly disagree___Strongly disagree___.

66. I have enjoyed pregnancy.
Very much___Somewhat___ A little___Not at all___.

67. I think that breast-feeding a baby is:
Unpleasant___Painful___Embarrassing___A nuisance___Neither pleasant or unpleasant___ Relaxing___Somewhat enjoyable____ Very enjoyable___.

68. Since I've been pregnant, I've had crying spells.
Frequently___ Occasionally___ Rarely___ Never___.

COURSE EVALUATION

Patient No._____

Date _____

1. What is your opinion of the length of the course?

   Too long_____

   Adequate_____

   Too short_____

2. Were the subjects included in the course adequately covered? Yes / No

   (If not) How many subjects were not? _____

3. Was there any subject covered that you would have liked to spend more time on? Yes / No

   (If so) Please specify _____

4. Could you understand all of the lectures? Yes / No

   (If not) How many could you not understand? _____

5. Did you feel that you were able to ask questions about the things that puzzled you, or were not discussed?

   Always _____

   Usually _____

   Sometimes _____

   Occasionally _____

   Never _____

6. Was there any part, or aspect of your labour and delivery experience that you felt you were not prepared for by the antenatal course? Yes / No

   (If so) Please specify _____

   _____

   _____

   _____

7. You may have some other comment to make about the course that you attended which is not covered by these questions. If so please feel free to comment now.

   _____

   _____

   _____

   _____

Table 22

Scoring Key for Psychological Reactions to Pregnancy*

Item	Score Weight	Item	Score Weight	Item	Score Weight	Item	Score Weight
1.	1,2,3,4	18.	4,3,2,1	35.	4,3,2,1	52.	4,3,2,1
2.	1,2,3,4	19.	4,3,2,1	36.	1,2,3,4	53.	4,3,2,1
3.	4,3,2,1	20.	1,2,3,4,5	37.	4,3,2,1	54.	4,3,2,1
4.	4,3,2,1	21.	1,2,3,4	38.	4,3,2,1	55.	1,2,3,4,5
5.	4,3,2,1	22.	4,3,2,1	39.	4,3,2,1	56.	4,3,2,1
6.	6,5,4,3,2,1, 1.	23.	4,3,2,1	40.	4,3,2,1	57.	4,3,2,1
7.	4,3,2,1	24.	4,3,2,1	41.	1,2,3,4	58.	4,3,2,1
8.	4,3,2,1	25.	4,3,2,1	42.	1,2,3,4	59.	4,3,2,1
9.	1,2,3,3,4,5	26.	4,3,2,1	43.	4,3,2,1	60.	4,3,2,1
10.	4,3,2,1	27.	5,4,3,2,2, 1,1	44.	3,1	61.	5,4,3,2,1
11.	4,3,2,1	28.	4,3,2,1	45.	4,3,2,1	62.	4,3,2,1
12.	4,3,2,1	29.	3,2,1	47.	4,3,2,1	63.	4,3,2,1
13.	4,3,2,1,1	30.	1,2,3,4	48.	1,1,2,3,3	64.	4,3,2,1
14.	4,3,2,1	31.	4,3,2,1	49.	4,3,2,1	65.	4,3,2,1
15.	4,3,2,1	32.	4,3,2,1	50.	4,3,2,1	66.	1,2,3,4
16.	2,2,1	33.	4,3,2,1	51.	1,1,1,1,1 1,1,1,0	67.	5,5,4,4,3, 2,2,1
17.	4,3,2,1	34.	1,2,3,4			68.	4,3,2,1

*For each item the score weights are those used for each possible response in the order of presentation in the questionnaire.

APPENDIX C

Summary tables of multiple regression analyses of predictor variables for various anxiety-related measures.

Tables 23-27

Summary tables of multiple regression analyses excluding Comfort scores.

Tables 28-35

Table 23

Summary of Multiple Regression Analysis of Predictor Variables for Sleep Disturbance during Pregnancy

Variable	Multiple R	R^2	R^2 Change
Tertiary Education	0.20	0.04	0.04
Comfort Level	0.26	0.07	0.03
No. of Miscarriages	0.30	0.09	0.02
Months	0.31	0.10	0.007
Gravida Status	0.31	0.10	0.003
Youngest Child	0.33	0.11	0.008
Oldest Child	0.33	0.11	0.003
Mean Week of Miscarriage	0.33	0.11	0.001
Parents Living	0.33	0.11	0.001
Antenatal Class Attendance	0.34	0.11	
Education	0.34	0.11	
Family in Locality	0.34	0.11	

Table 24

Summary of Multiple Regression Analysis of Predictor Variables for Fears for Self

Variable	Multiple R	R^2	R^2 Change
Tertiary Education	0.18	0.03	0.03
Gravida Status	0.10	0.04	0.005
Family in Locality	0.20	0.04	0.004
Comfort Level	0.21	0.04	0.002
Months	0.21	0.05	0.002
No. of Miscarriages	0.22	0.05	0.002
Youngest Child	0.22	0.05	0.001
Oldest Child	0.22	0.05	0.001
Antenatal Class Attendance	0.23	0.05	
Parents Living	0.23	0.05	
Mean Week of Miscarriage	0.23	0.05	
Education	0.23	0.05	

Table 25

Summary of Multiple Regression Analysis of Predictor Variables for Fears for Baby

Variable	Multiple R	R^2	R^2 Change
Family in Locality	0.16	0.03	0.03
Youngest Child	0.23	0.05	0.02
Mean Week of Miscarriage	0.27	0.07	0.01
Gravida Status	0.29	0.08	0.01
Tertiary Education	0.30	0.09	0.01
Comfort Level	0.31	0.10	0.006
Oldest Child	0.32	0.10	0.004
Education	0.32	0.10	0.002
Antenatal Class Attendance	0.32	0.10	0.001
Parents Living	0.32	0.11	0.001
No. of Miscarriages	0.32	0.11	

Table 26

Summary of Multiple Regression Analysis of Predictor Variables for Irritability and Tension

Variable	Multiple R	R^2	R^2 Change
Months	0.17	0.03	0.03
Comfort Level	0.24	0.06	0.03
Gravida Status	0.27	0.07	0.02
Youngest Child	0.28	0.08	0.003
Oldest Child	0.29	0.08	0.004
Mean Week of Miscarriage	0.29	0.08	0.001
No. of Miscarriages	0.29	0.08	0.002
Education	0.29	0.09	0.001
Parents Living	0.30	0.09	0.001
Antenatal Class Attendance	0.30	0.09	
Tertiary Education	0.30	0.09	
Family in Locality	0.30	0.09	

Table 27

Summary of Multiple Regression Analysis of Predictor Variables for Depression and Withdrawal

Variable	Multiple R	R^2	R^2 Change
Comfort Level	0.19	0.04	0.04
Months	0.22	0.05	0.01
Tertiary Education	0.24	0.06	0.007
Education	0.25	0.06	0.003
No. of Miscarriages	0.25	0.06	0.002
Youngest Child	0.25	0.06	0.002
Parents Living	0.26	0.07	0.002
Mean Week of Miscarriage	0.26	0.07	0.001
Antenatal Class Attendance	0.26	0.07	0.001
Oldest Child	0.26	0.07	0.001
Gravida Status	0.27	0.07	0.002
Family in Locality	0.27	0.07	

Table 28

Summary of Multiple Regression Analysis of Predictor Variables for Anxiety during Pregnancy excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Tertiary Education	0.18	0.03	0.03
Husband's SES	0.23	0.05	0.02
Husband's Age	0.27	0.07	0.02
Oldest Child	0.32	0.10	0.03
Education	0.34	0.11	0.01
Youngest Child	0.35	0.12	0.008
Antenatal Class Attendance	0.36	0.13	0.005
Gravida Status	0.36	0.13	0.005
Parents Living	0.37	0.14	0.004
No. of Female Children	0.37	0.14	0.002
No. of Miscarriages	0.37	0.14	0.001
No. of Male Children	0.37	0.14	0.002
Total No. of Children	0.39	0.16	0.019
Family in Locality	0.40	0.16	0.001
Age Wed	0.40	0.16	
Woman's Age	0.40	0.16	
Woman's SES	0.40	0.16	
Mean Week of Miscarriage	0.40	0.16	

Table 29

Summary of Multiple Regression Analysis of Predictor Variables for Sleep Disturbance during Pregnancy excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Tertiary Education	0.20	0.04	0.04
No. of Miscarriages	0.25	0.06	0.02
Husband's Age	0.27	0.08	0.01
Gravida Status	0.29	0.08	0.01
Husband's SES	0.31	0.10	0.01
Youngest Child	0.32	0.10	0.007
Months	0.33	0.11	0.006
Woman's Age	0.34	0.12	0.006
Oldest Child	0.35	0.12	0.003
Antenatal Class Attendance	0.35	0.12	0.002
Woman's SES	0.35	0.12	0.002
Parents Living	0.35	0.12	0.001
Education	0.35	0.13	0.001
No. of Female Children	0.36	0.13	
No. of Male Children	0.36	0.13	
Total No. of Children	0.37	0.13	0.007
Age Wed	0.37	0.13	
Family in Locality	0.37	0.13	

Table 30

Summary of Multiple Regression Analysis of Predictor Variables for Fears for Self excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Tertiary Education	0.18	0.03	0.03
Husband's Age	0.21	0.04	0.01
Wife's SES	0.22	0.05	0.005
Total No. of Children	0.24	0.06	0.007
Oldest Child	0.25	0.06	0.004
Family in Locality	0.25	0.06	0.003
Months	0.25	0.06	0.002
No. of Female Children	0.26	0.07	0.001
No. of Male Children	0.26	0.07	0.001
Husband's SES	0.26	0.07	0.001
Antenatal Class Attendance	0.26	0.07	0.001
Youngest Child	0.26	0.07	
Gravida Status	0.26	0.07	
Woman's Age	0.26	0.07	
No. of Miscarriages	0.26	0.07	
Parents Living	0.26	0.07	

Table 31

Summary of Multiple Regression Analysis of Predictor Variables for Fears for Baby excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Woman's Age	0.20	0.04	0.04
Mean Week of Miscarriage	0.24	0.06	0.02
Family in Locality	0.28	0.08	0.02
Youngest Child	0.30	0.09	0.01
Tertiary Education	0.31	0.10	0.005
Gravida Status	0.32	0.10	0.004
Oldest Child	0.33	0.11	0.006
Husband's Age	0.33	0.11	0.003
Antenatal Class Attendance	0.34	0.11	0.002
Total No. of Children	0.34	0.12	0.002
Education	0.34	0.12	0.002
No. of Male Children	0.35	0.12	0.001
No. of Female Children	0.35	0.12	0.002
Age Wed	0.35	0.12	
Months	0.35	0.12	
Husband's SES	0.35	0.12	
Woman's SES	0.35	0.12	
Parents Living	0.35	0.12	

Table 32

Summary of Multiple Regression Analysis of Predictor Variables for Irritability and Tension excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Age Wed	0.17	0.03	0.03
Total No. of Children	0.24	0.06	0.03
Months	0.29	0.08	0.03
Husband's Age	0.31	0.10	0.01
Youngest Child	0.32	0.10	0.007
Husband's SES	0.33	0.11	0.007
Woman's Age	0.34	0.12	0.006
Tertiary Education	0.34	0.12	0.004
Gravida Status	0.35	0.12	0.005
Parents Living	0.35	0.13	0.002
Oldest Child	0.36	0.13	0.002
Family in Locality	0.36	0.13	0.002
Mean Week of Miscarriage	0.36	0.13	0.001
No. of Miscarriages	0.36	0.13	0.001
Education	0.36	0.13	0.001
No. of Female Children	0.36	0.13	
No. of Male Children	0.36	0.13	0.001
Antenatal Class Attendance	0.37	0.13	
Woman's SES	0.37	0.13	

Table 33

Summary of Multiple Regression Analysis of Predictor Variables for Depression and Withdrawal excluding Comfort

Variable	Multiple R	R^2	R^2 Change
Husband's Age	0.22	0.04	0.04
Husband's SES	0.27	0.07	0.03
Total No. of Children	0.29	0.09	0.01
Months	0.31	0.09	0.007
No. of Miscarriages	0.31	0.10	0.004
Youngest Child	0.32	0.10	0.004
Woman's Age	0.32	0.10	0.003
Education	0.33	0.11	0.002
Gravida Status	0.33	0.11	0.002
Parents Living	0.33	0.11	0.002
Age Wed	0.34	0.11	0.002
Mean Week of Miscarriage	0.34	0.11	
Tertiary Education	0.34	0.11	
No. of Female Children	0.34	0.11	
No. of Male Children	0.34	0.12	0.001
Antenatal Class Attendance	0.34	0.12	
Oldest Child	0.34	0.12	
Family in Locality	0.34	0.12	

Table 34

Summary of Multivariate Analysis of Variance (Main Effects) of scores for High vs Medium/Low Anxious Married Subjects* on BIQ Variables excluding Comfort scores

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 1	1.79	16.00	43.00	0.06	0.63

UNIVARIATE F TESTS

Variable	F(1,58)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Months	0.01	0.03	0.925	0.05
Antenatal Class Attendance	0.57	0.41	0.452	-0.17
Gravida Status	0.23	0.13	0.629	0.47
Woman's Age	2.35	44.41	0.130	0.52
Husband's Age	0.85	15.41	0.360	-0.21
Age Wed	2.39	30.00	0.128	-0.49
Education	0.02	0.07	0.889	-0.19
Tertiary Education	11.86	2.41	0.001	-0.82
Husband's SES	7.14	14.01	0.010	0.73
No. of Male Children	0.08	0.03	0.773	0.99
No. of Female Children	0.07	0.03	0.790	1.14
No. of Miscarriages	0.00	0.00	1.000	-0.07
Family in Locality	3.98	0.83	0.051	0.16
Woman's SES	0.74	3.01	0.393	-0.65
Parents Living	0.39	0.13	0.532	0.22
Total No. of Children	0.04	0.03	0.838	-2.31

*Because of the small number involved, unmarried subjects were excluded from this analysis.

Table 35

Means and Standard Deviations (SD's) of BIQ Variables (excluding Comfort Scores) for High vs Medium/Low Anxious Married Subjects*

Variable	Anxiety Level			
	High (N=20)		Med/Low (N=40)	
	Mean	SD	Mean	SD
Months	6.20	1.85	6.25	1.93
Antenatal Class Attendance	2.05	0.83	1.87	0.85
Gravida Status	2.05	0.83	1.95	0.71
Woman's Age	24.15	5.28	25.97	3.80
Husband's Age	26.50	4.68	27.57	4.02
Age Wed	20.10	4.28	21.60	3.13
Education	4.50	1.23	4.57	2.23
Tertiary Education	0.10	0.31	0.52	0.51
Husband's SES	3.95	1.67	2.92	1.25
No. of Male Children	0.55	0.69	0.50	0.60
No. of Female Children	0.50	0.69	0.45	0.68
No. of Miscarriages	0.10	0.31	0.10	0.30
Family in Locality	0.85	0.37	0.60	0.50
Woman's SES	1.50	2.19	1.97	1.93
Parents Living	2.80	0.52	2.70	0.61
Total No. of Children	1.00	0.92	0.95	0.88

*Because of the small number involved, unmarried subjects were excluded from this analysis.

APPENDIX D

Summary tables of the remainder of the multivariate analyses of variance of pregnancy and anxiety data.

Tables 36-39

Table 36

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety data: Gravida Status and Trimester Interaction Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 4	0.90	40.00	908.11	0.653	0.23
2 through 4	0.84	27.00	703.69	0.700	0.21
3 through 4	0.72	16.00	480.00	0.775	0.18
4 through 4	0.50	7.00	240.50	0.832	0.12

UNIVARIATE F TESTS

Variable	F(4,248)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	0.47	47.20	0.758	0.50
Sleep Disturbance	0.49	48.97	0.743	0.36
Nausea	1.31	129.23	0.266	0.17
Fears for Self	0.76	77.01	0.553	0.33
Desire for Pregnancy	0.21	19.43	0.931	0.17
Dependency	1.61	161.19	0.173	0.64
Fears for Baby	0.71	71.58	0.587	-0.51
Irritability and Tension	1.60	154.51	0.175	-0.01
Maternal Feeling	1.68	167.39	0.154	-0.005
Depression and Withdrawal	1.37	137.36	0.244	-1.10

Table 37

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety Data: Gravida Status Main Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	3.75	20.00	478.00	0.001	0.42
2 through 2	2.56	9.00	239.50	0.008	0.30

INIVARIATE F TESTS

Variable	F(2,248)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1	2
Anxiety during Pregnancy	1.97	198.59	0.141	0.08	0.38
Sleep Disturbance	2.28	228.02	0.104	-0.64	0.40
Nausea	0.84	82.83	0.433	-0.09	0.05
Fears for Self	0.52	52.34	0.598	-0.20	-0.38
Desire for Pregnancy	14.79	1350.93	0.001	0.86	0.63
Dependency	0.42	41.92	0.659	-0.02	-0.08
Fears for Baby	1.46	147.90	0.233	0.42	-0.20
Irritability and Tension	2.29	221.75	0.103	-1.08	0.93
Maternal Feeling	0.52	52.19	0.592	-0.23	0.18
Depression and Withdrawal	0.47	47.37	0.620	1.06	-1.23

Table 38

Summary of Multivariate Analysis of Variance of Pregnancy and Anxiety data: Trimester Main Effects

Test of Roots	F	df(hyp)	df(error)	p less than	R
1 through 2	1.63	20.00	478.00	0.042	0.31
2 through 2	0.82	9.00	239.50	0.594	0.17

UNIVARIATE F TESTS

Variable	F(2,248)	Mean Square	p less than	Standardized Discriminant Function Coefficients 1
Anxiety during Pregnancy	0.68	68.18	0.509	-0.12
Sleep Disturbance	0.62	62.38	0.536	0.23
Nausea	2.11	208.22	0.123	-0.62
Fears for Self	0.61	62.32	0.542	0.08
Desire for Pregnancy	1.36	124.49	0.258	0.35
Dependency	0.37	37.31	0.690	-0.03
Fears for Baby	0.30	30.45	0.740	-0.03
Irritability and Tension	3.42	330.78	0.034	1.10
Maternal Feeling	1.36	135.29	0.258	-0.60
Depression and Withdrawal	1.10	110.02	0.335	-0.51

Table 39

Summary of Means and Standard Deviations for Multivariate Analysis of Variance of Gravida Status and Trimester

GROUPS				VARIABLE								
Gravida	Trimester	N	M SD	Anxiety dur.Prg	Sleep Dist.	Nausea	Fears Self	Desire Preg.	Depend -ency	Fears Baby	Irrit. &Tens.	Matern. Feeling	Depress. &Withdr.
Primi-	1	10	M	46.75	48.94	54.49	48.51	50.89	48.51	49.01	43.71	47.94	47.46
			SD	11.58	13.71	10.39	11.22	11.87	13.95	8.71	10.65	12.18	10.68
	2	10	M	45.95	46.98	50.71	48.51	43.74	48.51	51.78	46.51	54.17	49.26
			SD	8.31	9.10	11.12	10.15	1.69	7.93	9.44	8.68	10.05	8.78
	3	4	M	54.93	53.61	56.56	48.40	50.31	56.13	44.11	47.76	56.41	48.77
			SD	10.91	7.37	11.27	13.15	13.80	7.03	10.00	5.30	5.19	0.94
Dui-	1	32	M	49.02	47.62	48.30	48.33	51.64	46.99	50.30	47.67	49.87	49.89
			SD	9.13	9.79	10.68	9.31	9.47	11.91	9.87	10.55	8.79	10.23
	2	46	M	50.31	50.24	51.76	51.44	46.32	51.65	49.53	50.85	51.37	49.77
			SD	9.48	9.42	10.21	9.55	6.39	9.25	9.39	9.29	9.78	9.75
	3	38	M	51.66	50.31	50.35	48.99	51.63	48.92	49.16	49.95	50.45	48.30
			SD	11.97	10.13	10.41	9.16	11.16	9.69	10.90	10.14	8.97	9.44
Multi-	1	48	M	49.81	49.10	48.70	52.05	54.37	51.58	52.68	50.56	49.92	51.50
			SD	9.97	8.91	8.79	9.41	12.76	10.21	10.54	10.01	12.32	10.75
	2	51	M	49.12	51.13	47.70	49.85	46.61	50.29	49.33	49.71	46.91	48.91
			SD	9.78	10.11	9.29	11.49	6.16	9.21	9.69	9.87	7.75	9.84
	3		M	53.11	54.29	52.68	49.30	54.17	48.81	48.25	57.30	52.12	55.31
			SD	9.02	12.29	10.24	10.63	10.86	9.59	10.71	9.28	12.17	10.82

APPENDIX E

Summary of the mean anxiety levels of subjects attended by each doctor and medical centre.

Table 40

Medical Centre and Doctor

The question arose whether or not some doctors had more anxious patients than others, and whether some medical centres had more anxious patients than others. However, because so many variables relate to the anxiety of these pregnant women, especially socio-economic factors, it was considered inappropriate to analyze according to doctor and medical centre. The means for each medical centre and doctor can be seen in Table 40 but these have not been subjected to an analysis of variance.

Table 40

Summary of Mean Anxiety Levels for Subjects of Each Doctor and Medical Centre

Medical Centre		Doctor		
Code No.	Mean Anxiety Level*	Code No.	N of Ss	Mean Anxiety Level
1	66.98	1	18	68.10
		2	26	65.50
		3	3	72.70
2	66.70	4	6	69.50
		5	5	67.20
		6	1	74.00
		7	3	67.00
		8	3	57.70
3	69.50	9	18	72.50
		10	8	63.25
		11	20	69.25
4	69.60	12	8	67.00
		13	7	70.10
		14	2	78.00
5	65.50	15	4	61.25
		16	3	70.30
		35	1	68.00
6	68.50	17	16	67.90
		18	12	69.25
7	77.00	19	2	86.50
		21	9	72.70
8	57.70	22	3	57.70
9	69.85	24	10	69.80
		25	6	69.20
		26	18	70.00
		27	6	70.20
10	68.20	31	2	65.50
		32	7	70.30
		33	4	68.00
		34	5	66.60
11	64.00	30	9	64.00
12	80.00	28	9	80.00
13	82.50	29	2	82.50

*These anxiety levels are expressed in terms of raw scores.